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Gapping

Studies in Generative Grammar

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Jan Koster

Henk van Riemsdijk

Anneke Neijt

Gapping

A contribution to
Sentence Grammar



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to my parents

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Anneke Neijt
Utrecht

Introduction

Traditionally, reductions in coordinate constructions are a major point of departure for the study of sentence grammar and the nature of grammatical rules. In the transformational analysis of language, reduction phenomena have been used from the outset to motivate the existence of transformational rules and especially to argue for the necessity of variables for categories as well as for strings (cf. Chomsky 1957, 35). Due to the study of coordinations, further theoretical proposals appeared for the first time, such as restructuring operations, mirror image rules, transderivational constraints, across-the-board application of rules, and the notion of recoverability of deletion. Others disappeared for the same reason. The present study of reductions in coordinate constructions maintains this orientation towards the theory of grammar. It brings the characteristics of the conjunction reduction rule of Gapping to bear upon the general principles that constrain the notion of transformation.

The starting-point of the first chapter is the distinction between initial and non-initial coordination, which is used to illustrate a remarkable structural difference between English and Dutch. As regards the main issue, English and Dutch are shown to bear a striking resemblance vis-à-vis their reduction phenomena. The remainder of chapter 1 concentrates on nonphrasal conjunction, resulting in two conclusions. First, reduction of the first conjunct, so-called Backward Conjunction Reduction, turns out to be different from reduction in the other conjuncts, captured by Gapping.

The latter clearly belongs to sentence grammar, whereas the former almost certainly does not. Second, the distinction made in recent analyses between Forward Conjunction Reduction, Left Peripheral Deletion, Conjunct Movement and Gapping is abandoned. The sum of these phenomena can be shown to result from a generalized rule of Gapping.

The second chapter surveys some recent discussions of Gapping. The notion of recoverability is used to argue that there is no need for this rule to refer to specific constituents.

The third chapter shows, as carefully as current understanding allows, that the variable between the remnants of Gapping is sensitive to the Island Constraints. Although there is no a priori reason to expect that Gapping should obey constraints on movements, it turns out that there is a non-trivial parallelism between the scope of Gapping and that of WH-movement. This implies that any attempt to derive these restrictions from general principles such as Subjacency should apply both to movement rules and to Gapping. A revised notion of Subjacency is proposed to obtain this result.

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CHAPTER 1.

The Syntax of Coordination

This chapter supports the existence of some coordination rules and denies the existence of others. The first part considers coordination of constituents. A description of so-called "initial" and "non-initial" coordination is presented. This description is shown to give substance to straightforward distinctions within S- and VP-structures. The second part considers coordination of nonconstituents. The rules of Gapping and Backward Conjunction Reduction are claimed to give an exhaustive description of such coordinations. The third part reconsiders the Sentence Conjunction Hypothesis and the Phrasal Conjunction Hypothesis, and reviews the previously proposed rules of Forward Conjunction Reduction, Left Peripheral Deletion and Conjunct Movement. It is shown that these rules are superfluous given the proposed formulation of the rule of Gapping.

1. PHRASAL CONJUNCTION:

INITIAL VS. NON-INITIAL COORDINATION¹

Superficially, the difference between what is here called initial and non-initial coordination is a difference in the number of coordinators: in initial coordination, each conjunct is preceded by a coordinator; in non-initial coordination, the leftmost conjunct is not. Compare (1) and (2). (Throughout this monograph, the English and Dutch examples will be semantic parallels in most cases. Often, the Dutch examples will be clear even to those who never saw a word of Dutch before. In those cases where the Dutch examples are not transparent, a literal translation will be given.)

(1) Initial Coordination

- a. both John and Bob and Bill
en Jan en Bob en Bill
- b. either John or Bob or Bill
of Jan of Bob of Bill

(2) Non-initial Coordination

- a. John (and) Bob and Bill
Jan (en) Bob en Bill
- b. John (or) Bob or Bill
Jan (of) Bob of Bill

Initial coordinations can be formed by coordinators such as:

(in English:)	(in Dutch:)
both ... and ...	en ... en ...
either ... or ...	of ... of ...
neither ... nor ...	noch ... noch ...

Non-initial coordinations can be formed by coordinators such as and, or, nor in English and en, of, noch in Dutch.

There is an interesting difference in the distributions of initial vs. non-initial coordinations. In general both English and Dutch allow non-initial coordinations for non-maximal projections as well as for major phrases, cf. (3) and (4), whereas initial coordination is allowed for maximal projections of the lexical category only, cf. (5) and (6).

(3) Non-initial coordination of the major phrase

- a. NP: a small bus or a big car
een kleine bus of een grote auto
- b. PP: on our plates nor in our cups
op onze borden noch in onze kopjes
- c. AP: very red and very blue
erg rood en erg blauw

- d. VP: that he will eat and will drink
dat hij zal eten en zal drinken

(4) Non-initial coordination of the lexical category

- a. N: a small bus or car
een kleine bus of auto
- b. P: right above or beneath that little chest
vlak boven of onder dat kleine kastje
- c. A: very red and blue
erg rood en blauw
- d. V: that he will eat and drink
dat hij zal eten en drinken

(5) Initial coordination of the major phrase

- a. NP: either a small bus or a big car
of een kleine bus of een grote auto
- b. PP: neither on our plates nor in our cups
noch op onze borden noch in onze kopjes
- c. AP: neither very red nor very blue
noch erg rood noch erg blauw
- d. VP: that he neither did eat nor will eat
dat hij noch heeft gegeten noch zal eten

(6) Initial coordination of the lexical category

(with the apparent exception of the English verb)

- a. N: * a small either bus or car
* een kleine of bus of auto
- b. P: * right either above or beneath that little chest
* vlak of boven of onder dat kleine kastje
- c. A: * very both red and blue
* erg zowel rood als blauw
- d. V: that he will both eat and drink
* dat hij zal en eten en drinken

This regularity appears to be falsified by coordinations of lexical categories such as (7) and (8), for which super-

ficially both non-initial and initial coordination is grammatical.

(7) Non-initial coordination of the lexical category

- a. N: songs and stories about ghosts
liederen en verhalen over spoken
- b. P: in or on the chest
in of op de kast
- c. A: green or red with white dots
groen of rood met witte stippen
- d. V: that he called nor wrote to his lover
dat hij belde noch schreef naar zijn liefje

(8) (Apparent) initial coordination of the lexical categorie

- a. N: both songs and stories about ghosts
en liederen en verhalen over spoken
- b. P: either in or on the chest
of in of op de kast
- c. A: either green or red with white dots
of groen of rood met witte stippen
- d. V: that he neither called nor wrote to his lover
dat hij noch belde noch schreef naar zijn liefje

It is difficult to account for the ungrammaticality of (6) if one assumes that the coordinations in (8) are directly generated as initial coordinations of N, P, A and V. Therefore, it seems more reasonable to derive (8) transformationally as indicated in (9).

- (9) a. NP: both songs ~~about/ghosts~~ and stories about ghosts
en liederen ~~over/spoken~~ en verhalen over spoken

- b. PP: either in ~~the~~/~~chest~~ or on the chest
of in ~~de~~/~~kast~~ of op de kast
- c. AP: either green ~~with~~/~~white~~/~~dots~~ or red with
white dots
of groen ~~met~~/~~wit~~/~~stippen~~ of rood met witte
stippen
- d. VP: that he neither called ~~to~~/~~his~~/~~lover~~ nor
wrote to his lover
dat hij noch belde ~~naar~~/~~zijn~~/~~liefde~~ noch
schreef naar zijn liefde

No such 'final part' deletion could have generated the sentences of (6) from initial coordinations of major phrases, since in the examples of (6) the coordinated nodes themselves are final. Under the assumption that (8) derives from a richer underlying structure, the distribution of initial coordination obeys a well-defined pattern: maximal projections of a category may function as conjuncts in deep structure, but nonmaximal projections may not. The apparent exception of V in English in (6) will be discussed below.

In view of the grammaticality of (4), there is no specific advantage to be gained from the transformational derivation of non-initial conjunctions. I will therefore assume that non-initial coordinations are generated directly (cf. section 3.1.).

The resulting distribution of initial and non-initial coordinations may be summarized by the phrase structure rule schemata (10) and (11) (C stands for coordinator):

(10) Non-initial coordination

$X \longrightarrow X (C X)^n$, for any choice² of X

(11) Initial coordination

$X \longrightarrow C X (C X)^n$, where X is an abbreviation of
"maximal projection of a category".

These rule schemata abbreviate infinite sets of phrase structure rules, as in (10') and (11'):

- (10') $X \longrightarrow X C X$
 $X \longrightarrow X C X C X$
 $X \longrightarrow X C X C X C X$
 etc.
- (11') $X \longrightarrow C X C X$
 $X \longrightarrow C X C X C X$
 $X \longrightarrow C X C X C X C X$
 etc.

There is one property of initial coordination in Dutch that does not follow from the schema in (11). I will describe it briefly here, although its explanation will have to await further study. Compare the English and Dutch examples in (12):

- (12) a. The origin of either heaven or earth is unknown.
 *Het ontstaan van of de hemel of de aarde is onbekend.
- b. Near either the institute or the church is a lunchroom.
 *Bij of het instituut of de kerk is een cafetaria.
- c. The answers both of Mary and of John surprised him.
 *De antwoorden en van Marie en van Jan verrasten hem.

In English maximal projections, in no matter which hierarchical position, form grammatical initial coordinations. In Dutch, on the other hand, only maximal projections directly dominated by S or VP are possible conjuncts of a initial coordination. These constituents are usually referred to as major constituents (cf. Hankamer 1973, 18).

One pair of coordinators in Dutch, the pair zowel... als..., seems to behave like the English coordinators. For most speakers of Dutch, the following examples are grammatical:

(13) a. De antwoorden zowel van Marie als van Jan
verrasten hem.

(The answers both of Marie and of John
surprised him)

b. Hij sprak met zowel Jan als Piet.

(He spoke to both John and Peter)

Observe that the notion of major constituency cannot be expressed by phrase structure rule (11): phrase structure rules being context-free, there is no way to refer to the hierarchical position of the input node. This implies that the Dutch examples in (12) pose a problem, a solution of which, however, cannot be offered here.

The fact that initial coordination appears in major phrases exclusively can also be used as a diagnostic means of determining phrasal constituency. In particular, this mechanism can be employed towards the demonstration that Dutch word order is underlyingly SOV. This point will be developed below, in section 1.1., in a comparison of Dutch and English VP-structures. In section 1.2. I will then briefly compare Dutch and English S-structures.

1.1. VP STRUCTURES AND UNDERLYING SOV

In Dutch subordinate clauses, all verbs are final, although they may be followed by S- or PP-constituents, as in (14):

(14) a. ..., dat hij tulpen zal planten
(that he tulips will plant)

b. ..., dat hij tulpen zal planten in zijn voortuin
(that he tulips will plant in his front garden)

c. ..., dat hij de tulpen zal planten die hij heeft
gekregen
(that he the tulips will plant which he has got)

In main clauses, finite verbs usually obtain second position. All non-finite verbs obey the pattern observed in (14).

- (15) a. Hij zal tulpen planten.
(He will tulips plant)
b. Hij zal tulpen planten in zijn voortuin.
(He will tulips plant in his front garden)
c. Hij zal de tulpen planten die hij heeft gekregen.
(He will the tulips plant which he has got)

Thus, disregarding extraposition of S- and PP-constituents, Dutch subordinate clauses display SOV word order, while main clauses have SVO order.

Not unexpectedly, there has been some debate recently among linguists concerned with Dutch syntax whether to derive the subordinate clauses from SVO order by V-postposing or to derive the main clause from an SOV order by V-preposing. Surveys of the respective arguments pro and con are presented in Koster (1975) and Thiersch (1978). They both take SOV as underlying order. On the basis of the behavior of initial coordination in Dutch an argument can be constructed for the same position. The argument runs as follows.³

In subordinate clauses initial coordination is possible on the VP-phrase, not within the verbal complex itself, cf. (16) and (16'):

- (16) a. Omdat Jan en [_{VP}de rozen snoeit] en
[_{VP}de tulpen plant],...
(Because Jan both the roses prunes and
the tulips plants, ...)
b. Omdat Jan en [_{VP}de rozen zal snoeien] en
[_{VP}de tulpen zal planten],...
(Because Jan both the roses will prune and
the tulips will plant, ...)

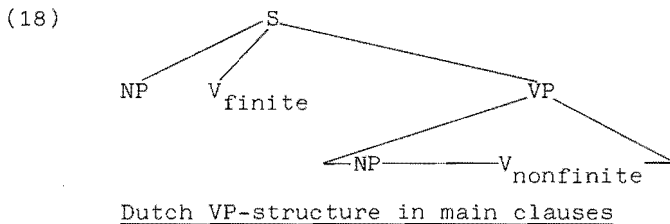
- (16') Omdat Jan de rozen zal en [_Vplanten] en
 [_Vsnoeien], ...
 (Because Jan the roses will both plant and
 prune, ...)

Projections of V in subordinate clauses thus obey the general pattern of initial coordinations: VPs may form initial coordinations, but Vs may not.

Now consider main clause variants of (16):

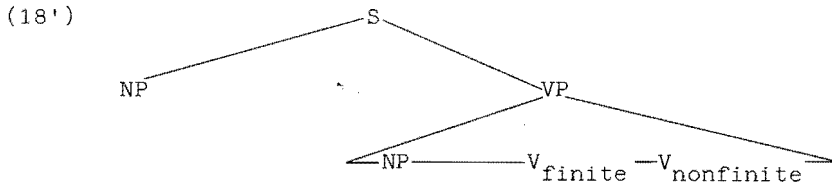
- (17) a. *Jan en snoeit de rozen en plant de tulpen.
 (Jan both prunes the roses and plants the tulips)
 b. *Jan en zal de rozen snoeien en zal de
 tulpen planten.
 (Jan both will the roses prune and will the
 tulips plant)
 (17') Jan zal en de rozen snoeien en de tulpen planten.
 (Jan will both the roses prune and the tulips plant)

From the criteria for initial coordination developed in section 1 it follows that in (17) finite verb plus object NP (plus nonfinite verb) are not together one constituent, whereas object NP plus nonfinite verb in (17') are. This can be anticipated if (18) is the surface structure of main clauses.



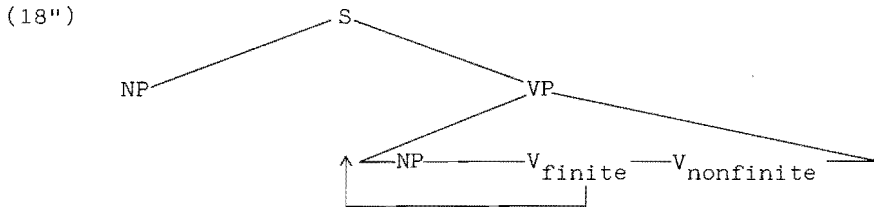
VP is a phrase fit to carry initial coordination, and there is no constituent to unite the finite verb and other daughters of VP under one label. This explains the ungrammaticality of (17), vs. the grammaticality of (17').

Compare (18) with the structure of subordinate clauses (18'). As shown by (16), in subordinate clauses all verbs are united under VP.



Dutch VP-structure in subordinate clauses

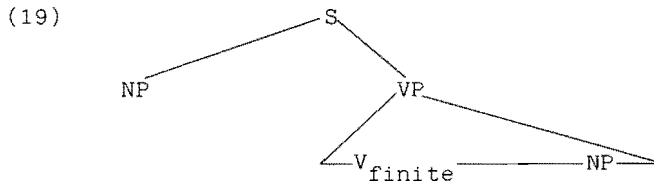
Structures (18) and (18') presuppose a Verb Fronting rule which moves the finite verb out of the VP in main clauses as follows:



Verb Fronting

Thus the SOV-structure of subordinate clauses underlies the superficial SVO order of main clauses.

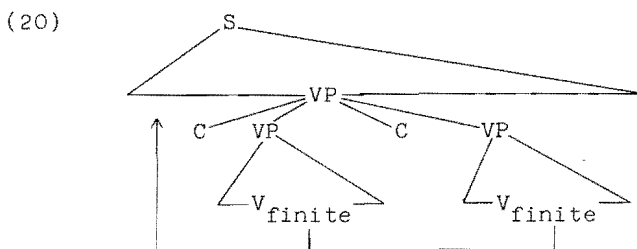
By contrast, if one assumes an underlying SVO order, in which verb and object are members of VP (see (19)), no explanations follow.



Examples (17) will have to be excluded by the ad hoc stipulation that Dutch, quite unlike English, requires the immediate

contiguity of the VP-dominated V and the leftmost constituent of the sentence. Additionally, it remains a mystery why (17') is grammatical.

Given underlying SOV word-order for Dutch, main clauses with an initial coordination of VPs will be derived by the rule of Verb Fronting in an across-the-board manner, whereby the finite verbs of all conjuncts are moved out of the coordination. This is schematized in (20):



Obviously, the across-the-board movement is possible only if the finite verbs are identical. Since Verb Fronting is an obligatory rule, there is no main clause variant of (21) in which the finite verbs differ:⁴

- (21) ..., dat Jan of wint of verliest.
 (... , that Jan either wins or loses)
- (22) * Jan of wint of verliest.
 (Jan either wins or loses)

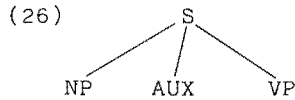
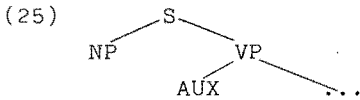
In English, the distribution of verbs in main and subordinate clauses obeys SVO-order throughout, and initial coordination of verbal phrases displays identical patterns in main as well as subordinate clauses (see Dougherty 1970, 865-7):

- (23) a. John neither did eat nor will eat.
 b. ..., that John neither did eat nor will eat.

(24) a. John both ate soup and drank beer.

b. ..., that John both ate soup and drank beer.

These examples suggest that Aux and VP are together one constituent. It follows that the sentential structure in English is as in (25), as proposed by Dougherty (1971, 315), rather than (26), as proposed by, e.g., Jackendoff (1972, 76; and 1977, 48).

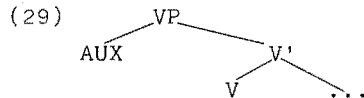
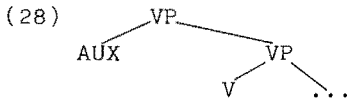


Furthermore, the hitherto anomalous initial coordinations such as

(27) a. John will both prune the roses and plant the tulips.

b. John did neither win nor lose.

which disobey the pattern of (6), suggest that a VP without its Aux constituent may function as a maximal phrase. Thus, the internal structure of VPs is (28) rather than structure (29), proposed by Sag (1976, 264):



Only if both VPs in (28) are called maximal projections, the examples of (27) obey the general pattern of initial coordinations, but this can hardly be taken into account as a serious solution.

Under this analysis of English and Dutch VP structures, the grammaticality of the comparable coordinations in (30) is explained differently in both languages.

- (30) John will both sing a song and dance a jig.
(Dougherty 1970, 865)

Jan zal én een lied zingen én een tango dansen.

For English, the analysis presented above claims that the VPs sing a song and dance a jig are maximal phrases throughout their derivation, whereas for Dutch, it is claimed that een lied zingen and een tango dansen are VPs out of which the finite verb (zal) has been removed across-the-board. This description of the seemingly parallel structures in (30) implies a crucial prediction. If the underlying VP contains only one verb, it will be possible to prepose it out of its VP and to construe an initial VP-coordination without a V in Dutch (cf. (31b) and (d)). Similar cases in English (cf. (31a) and (c)) are claimed to be ungrammatical. The facts are exactly as predicted.

- (31) a. *John gave both Mary an apple and Peter a pear.
b. Jan gaf én Marie een appel én Piet een peer.
c. *John gave either an apple to Mary or a pear
to Peter
d. Jan gaf of een appel aan Marie of een peer
aan Piet.

1.2. S STRUCTURES

As argued above, maximal projections of N, A, P, and V may form initial coordinations. Let us now consider initial coordinations of S:

- (32) a. *He regrets the fact either that Susan must leave for Africa or that Mary must leave for Europe.
*Hij betreurt het feit of dat Susan naar Afrika gaat of dat Mary naar Europa gaat.
(He regrets the fact either that Susan to Africa goes or that Mary to Europe goes.)
- b. *I am looking for someone either who lives near by or who still goes to school.
*Ik zoek iemand of die dicht bij woont of die nog op school zit.
(I look for someone either who near by lives or who still to school goes)
- c. *The difficulty either for Peter to buy food or for John to cook dinner is not obvious.
*Het bezwaar of om eten te kopen of om eten te koken maakt geen indruk.
(The difficulty either for food to buy or for food to cook makes no impression)
- (33) a. He regrets the fact that either Susan must leave for Africa or Mary must leave for Europe.
Hij betreurt het feit dat of Susan naar Afrika gaat of Mary naar Europa gaat.
- b. I am looking for someone who either lives near by or still goes to school.
Ik zoek iemand die of dicht bij woont of nog op school zit.
- c. ?The difficulty for either Peter to buy food or John to cook dinner is not obvious.
Het bezwaar om en eten te kopen en eten te koken maakt geen indruk.

Minor projections of S as in (33), form grammatical initial coordinations, and maximal projections of S as in (32), do

not. According to some version of X-bar theory, complementizers are related to sentences in the same way determiners are related to nouns. It should follow that complementizers are inseparable from an initial coordination of bare sentences. Thus the opposite pattern of grammaticalities is to be expected: (32) is to be as grammatical as either the boys or the girls, and (33) as ungrammatical as the either boys or girls.

Apart from this, (32) and (33) are interesting for several reasons. First, observe that they confirm the distinction between S and S'. This distinction is motivated for English sentences by the following examples in Bresnan (1974, 618):

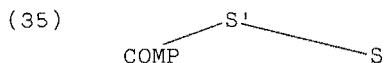
- (34) a. I can tell you when ~~he/left/me~~, but I can't tell you why he left me.

Ik kan je vertellen wanneer ~~hij/me/verliet~~, maar ik kan je niet vertellen waarom hij me verliet.

- b. I've been wondering whether ~~your/theory/is/correct~~ but wouldn't positively want to state that, your theory is correct.

Ik vroeg me wel af of ~~jouw/theorie/juist/is~~, maar ik kon niet bevestigen dat jouw theorie juist is.

The type of deletion displayed in (34) is a case of Backward Conjunction Reduction. In English, this rule deletes one constituent only (see section 2.2.2. below), and consequently, the examples in (34) provide evidence for structure (35):



In Dutch, Backward Conjunction Reduction is not restricted so as to delete strings which together are one constituent only. Therefore, the Dutch examples of (34) cannot be used to motivate the constituency of the shaded string. The examples

in (33) show, however, that structure (35) is in some way relevant to Dutch, as well.

Furthermore, the observed distinction might be helpful in determining the categorial status of main clauses. The following examples suggest that declaratives are S, whereas questions are S':

- (36) a. Either it rains or the sun is shining.
Of het regent of de zon schijnt.
- b. Either you win or you lose (Dougherty 1971, 315)
Of je wint of je verliest.
- (37) a. *Either does it rain or is the sun shining?
*Of regent het of schijnt de zon?
- b. *Either who wins or who loses?
*Of wie wint of wie verliest?

However, the implications of these observations lie well beyond the scope of the present study, and will not be further pursued here.

2. COORDINATIONS OF NONCONSTITUENTS

In general phrase structure rules can generate only coordinations of constituents. The following sentences thus cannot be generated unless the shaded parts are included in the coordinations. Here (38) and (39) incorporate base conjunctions of S:

- (38) Max said that John ate an apple and Peter ~~ate~~ a pear.
Max zei dat Jan een appel at en Piet een peer ~~at~~.
- (39) Max said that John bought ~~an apple~~ and Peter ate an apple.
Max zei dat Jan een appel ~~at~~ en Peter een peer at.

(38) is an instance of forward reduction: the reduced conjunct follows the full conjunct. (39) is an instance of backward reduction: the reduced conjunct precedes the full conjunct.

The facts of coordination reduction contribute to one of the earliest arguments for underlying syntactic structures (see Chomsky, 1957, 35^{ff.}). Several proposals have been worked out since, and the most interesting of these are briefly summarized in (40):

(40) ROSS & LAKOFF (see Ross 1967)

1. Forward Conjunction Reduction and Backward Conjunction Reduction (rules of left peripheral and right peripheral deletion, formulated together as one mirror-image rule)
2. Gapping (deletes verbs, backward in some languages and forward in others; the direction is determined by the structural position of the verb)

TAI (1969)

A rule of Deletion only, which applies forward and backward; the direction is determined by the structural position of the deletion site.

HANKAMER (1971)

1. Deletion, a general forward deleting rule, which effectuates internal and peripheral deletion.
2. Delay, right peripheral deletion.

SAG (1976)

1. Gapping, forward deletion of internal and rightperipheral parts.
2. Right Node Raising, a rightperipheral deletion, similar to Backward Conjunction Reduction.
3. Left Peripheral Deletion, similar to Forward Conjunction Reduction.

In this chapter we will show the necessity of two coordination reduction rules: a forward deletion rule (Gapping,

exemplified in (38)), and a backward deletion rule (Backward Conjunction Reduction, exemplified in (39)). Arguments will be presented that these rules differ drastically from one another to the extent that it is completely impossible to collapse them into one rule schema. Section 2.1. concerns the rule of Gapping. Section 2.2. is structured analogously to 2.1., but deals with Backward Conjunction Reduction. Each subsection of 2.1. and 2.2. concentrates on a difference between Gapping and Backward Conjunction Reduction.

This precedes the discussion of section 3, where it will be argued that Gapping and Backward Conjunction Reduction exhaust the number of coordination reduction rules. Next to these rules, no further rules are involved in the coordination reduction phenomenon.

2.1. GAPPING

In this section I will discuss the following theoretically most important characteristics of the rule of Gapping:

- (a) its remnants are major constituents;
- (b) it is a variable-changing rule;
- (c) it is a multiple-target rule;
- (d) the rule is island-sensitive;
- (e) its domains are S', S, and VP;
- (f) and the rule may apply across-the-board.

A (preliminary) formulation of Gapping is presented at the end of this section.

2.1.1. MAJOR CONSTITUENCY

Consider the sentences in (41).

(41) Charley writes with a pencil and John

$\left\{ \begin{array}{l} \text{writes with a pen.} \\ * \text{writes/writes a pen.} \\ * \text{writes/writes/a pen.} \end{array} \right.$

Karel schrijft met een potlood en John

$\left\{ \begin{array}{l} \text{schrijft met een pen.} \\ * \text{schrijft/schrijft een pen.} \\ * \text{schrijft/schrijft/een pen.} \end{array} \right.$

These examples show that Gapping does not delete subparts of major constituents (Hankamer 1973, 18).

2.1.2. VARIABLES AS TARGETS FOR DELETION OR INTERPRETATION

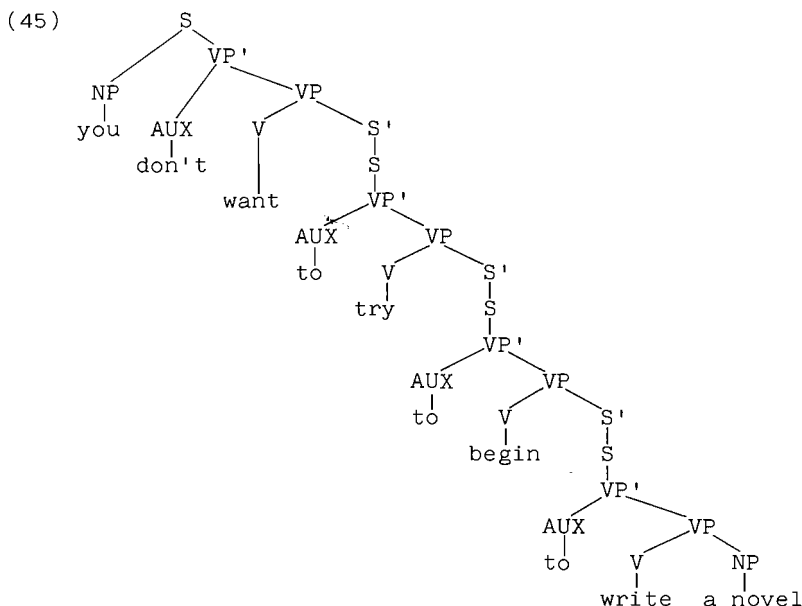
It is generally assumed that transformational rules can change constituents only, and that true variables may only function as contexts (see, e.g., Chomsky 1976, 312). Let us call this principle the 'constituent condition'. In this section it will be shown that the rule of Gapping deletes variables. Obviously, the consequence is either that Gapping is not a transformational rule, or that transformational rules are not constrained so as to change constituents only.

From the constituent condition it follows that the string deleted by Gapping forms one constituent. The various grammatical gapped variants of (42) thereby show the existence of the circled VP-nodes in (43):

-



-



The combination of (45) and (43) leads to the following paradoxical constituent structure, in which the A-constituents are shown to exist by Gapping, and the B-constituents are shown to exist by VP-deletion:

(46) you don't [B₁ [A₄ [A₃ [A₂ [A₁ want] A₁ to [B₂ try] A₂ to
 [B₃ begin] A₃ to [B₄ write] A₄ a novel] B₄ B₃ B₂ B₁

(or, omitting some brackets:)

[A₄ want to [B₂ try to begin to write] A₄ a novel] B₂

If Gapping were a constituent deleting rule, VP-deletion could no longer be one, obviously an unacceptable consequence. It is generally agreed that Gapping either deletes or interprets non-constituents. However, the consequences of this position are interpreted in various ways. As will be shown in chapter 2, Stillings assumes that a new kind of variable, the constituent variable, should be added to the

inventory of descriptive means available for expressing transformational rules. Fiengo assumes that Gapping is not a transformational rule, but a rule of interpretation, which applies to non-constituents. And others (whose proposals will be discussed in chapter 2: Hankamer, Langendoen, and Sag), assume that the constituent condition simply does not hold for deletion transformations. All authors therefore agree that a less restricted theory should be developed in order to cover the Gapping data.

2.1.3. MULTIPLE TARGET DELETION

Gapping deletes discontinuous parts of coordinated sentences, cf. (47):

- (47) a. Betsy believed Peter to be sexy, and Alan
~~believed~~ Barbara ~~to be sexy~~. (Sag 1976, 223)
- b. Time wanted Udall to get the nomination, and
 Newsweek ~~wanted~~ Carter ~~to get the nomination~~.
 (Sag 1976, 223)
- c. omdat Karel voorgesteld heeft mosselen te
 bestellen en Harrie ~~voorgesteld heeft~~ oesters
~~te bestellen~~.
 (since Karel proposed has mussels to order and
 Harrie ~~proposed has~~ oysters ~~to order~~)
- d. omdat Karel van plan is een boot te kopen en
 Harrie ~~van plan is~~ een kampeerauto ~~te kopen~~.
 (since Karel plans has a boat to buy and Harrie
~~plans has~~ a camper ~~to buy~~)

These examples show that Gapping deletes discontinuous strings. It follows that Gapping violates a second generally accepted constraint, the constraint that only one target may be involved in a transformational rule.

2.1.4. ISLAND SENSITIVITY

The key observation regarding the rule of Gapping is that the variable deleted is island sensitive. Hankamer was the first to notice this (1971, 20: "Gapping also obeys the various island constraints demonstrated in Ross (1967) to constrain deletion and movement transformations"), although his examples, given here in (48) are extremely unfortunate.

(48) a. Coordinate Structure Constraint:

*Alfonse cooked the rice, and Harry ~~cooked~~ and ate the beans.

b. Sentential Subject Constraint:

*Alfonse ate the rice, and that Harry ~~ate~~ the beans is fantastic.

c. Complex NP Constraint:

*Alfonse ate the rice, and I was stunned by the fact that Harry ~~ate~~ the beans.

These examples do not show that the variables deleted obey the island conditions, since only one constituent (V in all cases) disappears. What these examples do show is that the remnants of Gapping should be major constituents, and it is this condition on the remnants which excludes (48). From this point of view one understands why Hankamer did not investigate the matter more thoroughly.

The Island Constraints themselves restrict the scope of variables. Since Gapping deletes variables, it is to be expected that these variables themselves are constrained. The relevant constructions are therefore:

(49) a. Coordinate Structure Constraint:

*Alfonse cooked the rice and the beans and Harry ~~cooked/ate/rijsde/aten~~ the potatoes.

*Alfons kookte de rijst en de bonen en Harry ~~kookte/ate/rijsde/aten~~ de aardappels.

b. Sentential Subject Constraint:

*That Alfonse ate the rice is fantastic and ~~that~~
Harry ~~ate~~ the beans ~~is/fantastic~~.

*Dat Alfons rijst at is prachtig en ~~dat~~
Harry bonen ~~at/is/prachtig~~.

c. Complex NP Constraint:

*Alfonse discussed the question of which rice we
would eat and Harry ~~discussed/that/question~~ (of)
which beans ~~we/which/eat~~.

*Alfons besprak de vraag welke rijst we zouden
eten en Harry ~~besprak/de/vraag~~ welke bonen
~~we/zouden/eten~~.

This demonstrates that the variable involved in Gapping is in line with the variable of other rules of sentence grammar. It implies that Gapping, far from being an additional peculiarity of language, belongs to the core of grammar. This observation is of the utmost importance, since in other respects Gapping differs from other rules of sentence grammar. The sections 2.1.1. and 2.1.2. already revealed that the target of Gapping is a variable and that more than one target may be involved in the rule. The rule is of crucial relevance to the conditions on rules of sentence grammar, since the study of Gapping phenomena may give insight in the status of some alleged conditions on these rules. Further problems for Gapping as a rule of sentence grammar will be presented in 2.1.5. and 2.1.6.

2.1.5. THE DOMAINS OF GAPPING

Gapping applies to coordinations of S', S and VP, as is shown in (50), (51), and (52), respectively:

- (50) a. Who wants to invite Peter and who ~~wants to~~/~~invite~~ Mary?

Wie wil Peter uitnodigen en wie ~~will~~ Marie ~~will~~/~~nodigen~~?

- b. It is not clear which books are chosen by Mary, and which books ~~are~~/~~chosen~~ by Max.

Het is niet duidelijk welke boeken door Marie gekozen zijn en welke boeken door Max ~~gekozen~~ zijn.

- (51) a. Either John kissed Mary or Mary ~~kissed~~ Peter.

Of Jan heeft Marie gezoend of Marie ~~heeft~~ Peter ~~gezoend~~.

(Either Jan has Marie kissed or Marie ~~has~~ Peter ~~kissed~~)

- b. The fact that either John went to Europe or Peter ~~went~~ to South Africa, bothered him a lot.

Het feit dat of Jan naar Europa zou gaan of Peter naar Zuid Afrika ~~zou~~/~~gaat~~ zat hem erg dwars.

- (52) a. John either gave a book to Mary or ~~gave~~ a bunch of flowers to her sisters.

John heeft of een boek aan Mary gegeven of een bos bloemen aan haar zusjes ~~gegeven~~.

- b. John both tried to put his car in the garage and ~~tried~~/~~to~~/~~put~~ his bike in the barn.

Jan probeerde zowel zijn auto in de garage te zetten als zijn fiets in het schuurtje ~~te~~/~~zetten~~.

The initial coordinators in (51) and (52) indicate that these examples in fact are coordinations of S in the former and VP in the latter. In non-initial coordinations such as (53), it is impossible to determine the domain of application of Gapping: both VP and S coordinations may have been the input of Gapping:

(53) John tried to tell Mary that she was right and

	John / tried / to / tell Max that he was wrong
	tried / to / tell Max that he was wrong.
	to / tell Max that he was wrong.

Jan probeerde Jo te vertellen dat ze gelijk had en

	Jan / probeerde Ko te / vertellen dat hij ongelijk had.
	probeerde Ko te / vertellen dat hij ongelijk had.
	Ko te / vertellen dat hij ongelijk had.

It might be concluded that the various underlying forms of (53) indicate that the formulation of Gapping is overly unconstrained, since only one interpretation is available to these sentences. From this it would follow that additional mechanisms should be invented to restrict two of the three derivations in (53). On the other hand, the fact that an unambiguous sentence has several deep structures and several derivations is problematic only in case these different derivations are represented differently at the level of logical form. This point remains to be shown, however.

As shown by (50), (51) and (52), Gapping preferably deletes V in coordinations of S', S or VP. This observation might lead one to expect that Gapping will delete N in coordinations of NPs, P in coordinations of PPs, A in coordinations of APs, and Q in coordinations of QPs. This, however, cannot be maintained. Of these possibilities, only Gapping in NPs seems to occur. (This rule of N-Gapping applies more freely in English than in Dutch, as shown by the ungrammaticality of (54b).)

(54) NP:

- a. One dog with five legs, another ~~dog~~ with a cow's liver, and a third ~~dog~~ with no head.

Een hond met vijf poten, een tweede ~~hond~~ met een koeielever, en een derde ~~hond~~ zonder kop.

- b. Rome's destruction of Carthage and the Hun's ~~destruction~~ of Rome.
 *Romes vernietiging van Carthago en Hannibals ~~vernietiging~~ van Rome.
 PP:
- c. *Several inches above the ground and several feet ~~above~~ sea level.
 *Enkele centimeters boven de grond en enkele meters ~~above~~ zee niveau.
- d. *A week ago, or a month ~~ago~~, he left for NY.
 *Een week geleden, of een maand ~~ago~~, vertrok hij naar NY.
 AP:
- e. *A five year younger or 10 year ~~younger~~ sister.
 *Een vijf jaar jonger of 10 jaar ~~younger~~ zusje.
- f. *He ran a few seconds faster or a few minutes ~~faster~~ to his house.
 *Hij liep enkele seconden of enkele minuten ~~faster~~ naar huis.
 QP:
- g. *Bill drank much too much or a little bit ~~too much~~ wine.
 *Wim dronk veel te veel of een beetje ~~too much~~ wijn.
- h. *John bought a little bit more or a lot ~~more~~.
 *Jan kocht een beetje meer of een heleboel ~~more~~.

It may be worthwhile to consider Gapping in NPs in some detail. The rule of N-Gapping differs from the V-Gapping discussed above in several respects. First, V-Gapping applies to coordinations only (see 2.1.5. above), N-Gapping is not similarly constrained:

- (55) a. After the dog with a cow's liver died, he wanted to buy one /// with five legs.

Toen de hond met een koeielever gestorven was, wilde hij er een //// met vijf poten kopen.
(When the dog with a cow's liver died had, wanted he there one //// with five legs buy)

- b. A dog with five legs will win from one /// with two tails.

Een hond met vijf poten zal winnen van een //// met twee staarten.

Observe that this is not necessarily a case of deletion of dog or hond. In N-Gapping, a linguistic antecedent of the absent N need not be present. V-Gapping on the other hand cannot do without a full linguistic antecedent.

- (56) (Discussing dogs:)

My father once bought one with five legs.
Mijn vader kocht er eens een met vijf poten.

- (57) (John shows that he can peel apples:)

Look at me! *I ~~can/peel~~ pears!
Kijk eens! *Ik ~~kan~~ peren ~~schillen~~!

Second, V-Gapping deletes true variables (as shown in section 2.1.1.). If N-Gapping deletes more than a single N or N', however, the output is ungrammatical:

- (58) a. *Peter's story about the explanation of these sentences, and Max's ~~story/about/the/explanation~~ of these phrases.

*Een verhaal van Peter over de verklaring van deze zinnen, en ~~een/verhaal~~ van Jan ~~over/de/verklaring~~ van deze zinsdelen.

- b. *Rome's hope of the destruction of Carthage and Carthage's ~~hope of the destruction~~ of Rome.
 *De hoop van Rome op de vernietiging van Carthago en ~~de hoop van Carthago op de vernietiging~~ van Rome.
- c. *Rome's attempt to destroy Carthage and Carthage's ~~attempt to destroy~~ Rome.
 *De poging van Rome Carthago te verwoesten en ~~de poging van Carthago Rome te verwoesten~~.

(In Dutch, N-Gapping after a genitive NP is impossible for independent reasons; therefore, examples with an agentive postnominal PP are given.) The ungrammaticality of (58) shows it to be unlikely that N-Gapping can be formulated as a rule of variable deletion.

Finally, N-Gapping seems to be most acceptable in those cases where the N deleted resembles V. Thus, compare (59) and (60):

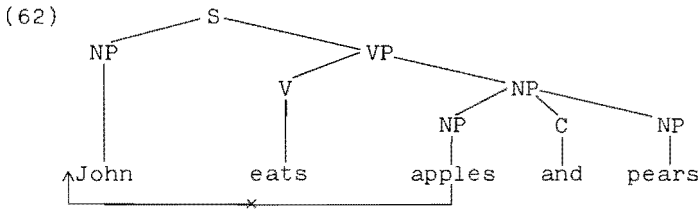
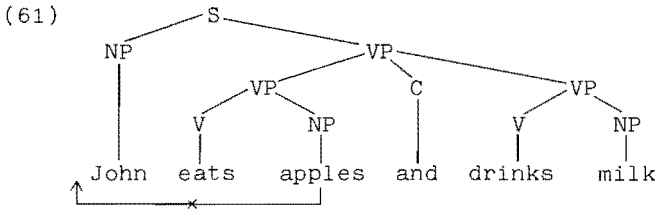
- (59) *The doll with blue eyes of John's and ~~the doll~~ with curling hair of Peter's, ...
 *De pop met blauwe ogen van Jan en ~~de pop~~ met krullen van Peter, ...
- (60) The review of John's book by Max, and ~~the review~~ of John's article by Susan, ...
 De kritiek van Max op Jans boek en ~~de kritiek~~ van Harry op Jans artikel, ...

Further study might reveal that Gapping of "nominal" nouns is different from Gapping of "verbal" nouns.

Many uncertainties remain regarding the analysis of N-Gapping, but the above-mentioned differences between N-Gapping and V-Gapping suggest that these rules cannot be collapsed into one. The domains in which V-Gapping (or Gapping tout court) applies are VP, S, and S' only. This is an observation in need of an explanation.

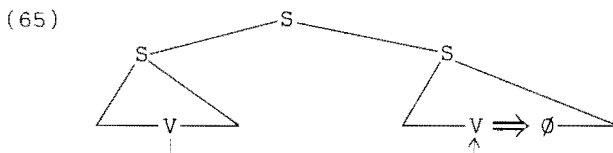
2.1.6. THE COORDINATE STRUCTURE CONSTRAINT AND ACROSS- THE-BOARD APPLICATIONS

The Coordinate Structure Constraint (Ross 1967, 89) prohibits movement of a conjunct, and movement of an element contained in a conjunct. Thus, apples in both (61) and (62) cannot be moved, as shown by (63) and (64) respectively:



- (63) * Which apples does John eat and drink milk?
 * Welke appels eet Jan en drinkt melk?
- (64) * Which apples does John eat and pears?
 * Welke appels eet Jan en peren?

In order to cover the rule of Gapping, which is not a movement rule, the Coordinate Structure Constraint must be altered slightly. First observe that Gapping sets itself apart from other rules of sentence grammar in that it applies to "cojacent" structures (Koster 1978b, 216). The antecedent and the deletee are in different conjuncts of the coordination:



No other rule of sentence grammar relates the two positions linked by the lower arrow. One might conclude that Gapping in this respect violates the Coordinate Structure Constraint. From another point of view, however, Gapping obeys the Coordinate Structure Constraint just as much as WH-movement. It appears that by Gapping the variables deleted may not contain a part of the coordinated structure, or alternatively, that the remnants may not be a conjunct or an element contained in a conjunct:

- (66) *John eats pears and drinks milk and Peter
~~eat~~ apples ~~and~~/~~drinks~~/~~milk~~.
 *Jan eet peren en drinkt melk en Peter ~~eat~~ appels
~~en~~/~~drinks~~/~~milk~~.
- (67) *John eats bananas and pears and Peter ~~eat~~ apples
~~and~~/~~pears~~.
 *Jan eet bananen en peren en Peter ~~eat~~ appels ~~en~~
~~pears~~.

This suggests that two parts of the rule of Gapping should be clearly distinguished: one relating the complete antecedent sentence and the gapped sentence, as illustrated by (65), and the other relating the remnants of the rule. Only the latter part obeys the Coordinate Structure Constraint, cf. (66) and (67). More will be said about this distinction in chapter 2.

Ross (1967, 9) mentions a class of 'exceptions' to the Coordinate Structure Constraint, the so-called across-the-board phenomena. It turns out that a constituent may be moved out of a conjunct in case parallel constituents move out of other conjuncts as well. See (68) (the arrows link the positions involved in the movement):

(68) It's potatoes that John likes and Mary hates .

(Grosu 1972, 220)

Dat is iets wat Karel wel lust en Marie niet lust.

It is clear that the rule of Gapping applies in an across-the-board fashion: it reduces a coordination with an infinite number of conjuncts, under identity with the first conjunct:

(69) a. John eats apples, Peter ~~eats~~ pears, Mary ~~eats~~ bananas, ..., and Bill ~~eats~~ grapes.

Jan eet appels, Piet ~~eet~~ peren, Marie ~~eet~~ bananen, ..., en Wim ~~eet~~ druiven.

b. John likes potatoes and Mary ~~likes~~ beans, or Mary ~~likes~~ potatoes and John ~~likes~~ beans.

Jan houdt van aardappels en Marie ~~houdt~~ van bonen, of Marie ~~houdt~~ van bonen en Jan ~~houdt~~ van aardappels.

The examples (66), (67), and (69) indicate that the combination of the Coordinate Structure Constraint and across-the-board application of rules is relevant to Gapping as well.

There are two attempts in the recent literature to explain both the Coordinate Structure Constraint and across-the-board application of syntactic rules: Schachter (1977) and Williams (1978). Schachter rephrases the Coordinate Structure Constraint as a Coordinate Constituent Condition, a surface structure constraint requiring that

"the constituents of a coordinate structure must belong to the same syntactic category and have the same semantic function".

Thus, (70) is ruled out by lack of parallelism of syntactic function, and (71) is ruled out for semantic reasons:

(70) *It's odd for John to be busy and that Helen is idle now.

*Ik wist niet of hij kwam en dat zij wegbleef.
(I knew not whether he came and that she stayed away.)

(71) *John ate with his mother and with good appetite.

*Jan at met zijn moeder en met veel smaak.

Schachter claims that this formulation covers the Coordinate Structure Constraint together with the across-the-board exceptions. The underlying idea is that by across-the-board rule application the coordinate conjuncts are still parallel and thus obey the Coordinate Constituent Condition. Left untouched however is the crucial notion of parallelism. The problem is how to define syntactic and semantic sameness. Therefore, Schachter's Coordinate Constituent Condition can be seen as a restatement of the problem at best.

Williams (1978) gives a formalized account of across-the-board rule applications. Coordinate structures are factorized simultaneously, as illustrated in (72), a structure to which the rule of WH-movement is applicable:

(72) COMP	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">[John saw</td> <td style="padding: 5px;">who] S</td> <td style="border-right: 1px solid black; padding: 5px;">and</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">[Bill hit</td> <td style="padding: 5px;">who] S</td> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">]S</td> </tr> </table>	[John saw	who] S	and		[Bill hit	who] S]S
[John saw	who] S	and							
[Bill hit	who] S]S						
1	2	3	4						

Application of WH-movement to this factorization yields (73). A copy of who is placed in COMP and factor 3 is deleted:

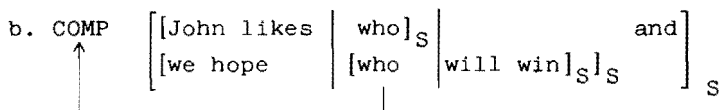
(73) COMP	<table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">[John saw</td> <td style="padding: 5px;">∅] S</td> <td style="border-right: 1px solid black; padding: 5px;">and</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">[Bill hit</td> <td style="padding: 5px;">∅] S</td> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">]S</td> </tr> </table>	[John saw	∅] S	and		[Bill hit	∅] S]S
[John saw	∅] S	and							
[Bill hit	∅] S]S						
who									

Williams' proposal implies that the only way to change a factor contained in a coordinate structure is by across-the-board application, since coordinate structures must be factorized simultaneously.

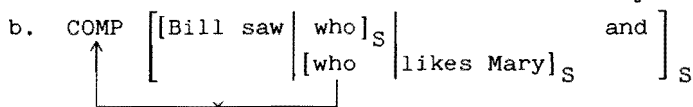
Furthermore, Williams proposes a separate condition on the factorization of coordinate structures (Williams 1978, 32)⁵. In effect, this constraint on the notion 'factor' and the old Coordinate Structure Constraint yield the same result: movement of a conjunct or an element contained in a conjunct must apply across-the-board, or else the output is ungrammatical.

This ingenuous account of the coordinate structure phenomena in terms of factorization of structural descriptions adds to Ross' analysis a mechanism that specifies which factors count as "parallel". It predicts that object-who and more embedded subject-who are parallel in (74), while object-who and equally embedded subject-who in (75) are not parallel:

- (74) a. I know the man who John likes and we hope will win.



- (75) a. *I know a man who Bill saw and likes Mary.



For some reason, the difference illustrated in (74) and (75) is not reproducible in Dutch, neither in relative clauses, nor in WH-questions:

- (74') a. *Ik ken de man die hij aardig vindt en wij hopen dat zal winnen.

(I know the man who he likes and we hope that will win)

- b. *Wie vindt hij aardig en hopen zij dat zal winnen?

(Who does he like and hope they that will win?)

(75') a. *Ik ken de man die hij aardig vindt en haar zag.
(I know the man who he likes and her saw)

*Wie vindt hij aardig en zag haar?
(Who does he like and saw her?)

Observe that the ungrammaticality of (74') is not due to the surface filter prohibiting empty NPs after dat, as shown by (74").

(74") a. Ik ken de man die wij hopen dat zal winnen.
(I know the man who we hope that will win)

b. Wie hopen zij dat zal winnen?
(Who hope they that will win?)

See Maling and Zaenen (1978) and the references cited there. The universality Williams claims for his definition of factor is thus challenged. For unclear reasons Dutch differs in this respect from English.

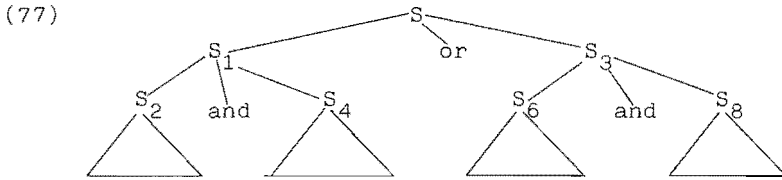
One final problem for the notion of simultaneous factorization is worth pointing out. Consider sentences such as in (76), structured as in (77).

(76) a. John gave the book to Mary and ~~John/gave~~
the record to Sue, or ~~John/gave~~ the book to Sue
and ~~John/gave~~ the record to Mary.

Jan gaf het boek aan Mary en ~~Jan/gaf~~ de plaat aan
Sue, of ~~Jan/gaf~~ het boek aan Sue en ~~Jan/gaf~~
de plaat aan Mary.

b. John invited Sue and Max ~~invited~~ Mary, or Max
~~invited~~ Sue and John ~~invited~~ Mary.

John vroeg Susan en Max ~~vroeg~~ Marie, of Max ~~vroeg~~
Susan en John ~~vroeg~~ Marie.



In (76), an element of S_4 , S_6 , and S_8 is deleted under identity with an element of S_2 . Observe that this deletion is possible only if S_2 , S_4 , S_6 , and S_8 all contain identical parts. The deletion is not possible in case only parts of S_2 and S_4 are identical to parts of S_6 and S_8 respectively (see (78)):

- (78) a. *John gave the book to Mary and he handed the record to Sue, or ~~he/gave~~ the book to Sue and ~~he/handed~~ the record to Mary.
- *John gaf het boek aan Mary en hij overhandigde de plaat aan Sue, of ~~hij/gaf~~ het boek aan Sue en ~~hij/overhandigde~~ de plaat aan Mary.
- b. *John saw Sue and Max invited Mary, or Max ~~saw~~ Sue and John ~~invited~~ Mary.
- *Jan zag Susan en Max vroeg Marie, of Max ~~zag~~ Susan en Jan ~~vroeg~~ Marie.

In order to derive (76) and exclude (78), Williams stipulates that X_1 and X_2 in (79) are identical, whereas X_1 and X_2 in (80) are not:

$$(79) \quad X_1 = \begin{bmatrix} I_{S_2} \text{ John gave} & \dots \\ I_{S_4} \emptyset & \emptyset \end{bmatrix} \quad X_2 = \begin{bmatrix} I_{S_6} \text{ John gave} & \dots \\ I_{S_8} \emptyset & \emptyset \end{bmatrix}$$

$$(80) \quad X_1 = \begin{bmatrix} I_{S_2} \text{ John gave} & \dots \\ I_{S_4} \text{ he handed} \end{bmatrix} \quad X_2 = \begin{bmatrix} I_{S_6} \text{ John gave} & \dots \\ I_{S_8} \text{ he handed} \end{bmatrix}$$

This implies that a definition of identity needs to refer to prior application of Gapping, which is a potential problem. Williams' account is interesting, however, in that it correlates the Coordinate Structure Constraint and across-the-board rule application in an explicit way. Further study might solve the problems noticed above.

2.1.7. CONCLUSION: THE FORMULATION OF GAPPING

The presently most important characteristic of the rule of Gapping was pointed out in section 2.1.4.: Gapping is a rule of sentence grammar. In the recent literature this point has been the subject of some debate. Hankamer and Sag (1976, 410) suggest that Gapping is a rule of discourse, although Sag's statement (1976, 192) to this effect is worded more carefully:

"Gapping can indeed apply in discourse, at least sometimes.

(3.1.7.) Speaker A: Jorge is peeling an apple.

Speaker B: And Ivan \emptyset an orange.

It's not at all clear, however, what to make of examples like this. The discourse in (3.1.7.) seems to some people to be a peculiar case of two people collaborating on what is actually a single sentence, in which case Gapping should perhaps be restricted to single sentences. Alternatively, one might argue that Gapping is a rule of discourse grammar, but that since Gapped clauses must begin with conjunctions, it is only in peculiar situations like (3.1.7.) that Gapping can apply intersententially."⁶

It appears to me that this problem concerning the status of the rule of Gapping is in fact closely related to the formulation of the rule. In particular: it has been agreed unanimously that in the rule of Gapping both the full and the

reduced conjunct should be mentioned. This yields an extensive formulation of the rule, as in (81):

(81)	W_1	A	W_2	B	W_3	{and, or}	W_1	A'	W_2	B'	W_3
	1	2	3	4	5	6	7	8	9	10	11
\Rightarrow	1	2	3	4	5	6	\emptyset	8	\emptyset	10	\emptyset

In this formula, W is a true variable (a string of constituents, one constituent, or zero), and A and B are constituent variables (one constituent or zero).

To this formulation the discourse in Sag's (3.1.7) is a problem. To my knowledge, there is no other rule of sentence grammar which spreads across speakers. Furthermore, (81) is a very peculiar rule of sentence grammar. There are no other rules of sentence grammar which apply to the interior of the conjuncts of a coordination. Observe that the antecedent string has no bearing on the structural changes of the rule, except for identity and parallelism. But these two notions are presumably related to semantics, not to syntax. Thus, there seems to be no syntactic motivation to mention the full anteceding sentence. On the contrary, the extensive formulation of Gapping would run into trouble with examples such as (76) (some of them repeated here for convenience in (82)). Observe that the domain of (81) can never be defined so as to include (82), but to exclude (83):⁷

- (82) John invited Sue and Max ~~invited~~ Mary, or Max
~~invited~~ Sue and John ~~invited~~ Mary.

John vroeg Susan en Max ~~vroeg~~ Marie, of Max
~~vroeg~~ Susan en John ~~vroeg~~ Marie.

- (83) * John invited Sue and Max ~~invited~~ Mary, or Max
~~invited~~ Sue and John invited Mary.

* John vroeg Susan en Max ~~vroeg~~ Marie, of Max
~~vroeg~~ Susan en John vroeg Marie.

For these reasons, the extensive formulation of Gapping must be rejected and we postulate a small-scale formulation in its place:⁸

(84) Gapping

$$\begin{array}{ccccccccc} W_1 & A & W_2 & B & W_3 & & & & \\ 1 & 2 & 3 & 4 & 5 & \Rightarrow & \emptyset & 2 & \emptyset & 4 & \emptyset \end{array}$$

While its adequacy will have to be demonstrated, this formulation has at least one clear point in its favor a priori: it triggers the convention that the factors of a rule of sentence grammar form a single constituent (cf. De Haan 1977, 74). For (84) this implies that factors 1-5 are one constituent, a desirable result.

The observation will come as no surprise however, that (84) is a very unconstrained formulation of the rule of Gapping. Ways to constrain the rule so as to meet the characteristics observed in 2.1.1. (the remnants are major constituents), 2.1.4. (the rule obeys Island Constraints) and 2.1.5. (the domains are S', S and VP) will be discussed in chapters 2 and 3. Furthermore, in chapter 2 the relation between the antecedent string and the deleted string omitted by (84) will be discussed. It will be claimed that this relation cannot be properly considered in sentence grammar.

2.2. BACKWARD CONJUNCTION REDUCTION

It can be shown in at least five separate ways that the rule of Backward Conjunction Reduction (reduction in conjuncts which precede the final conjunct) is different from the rule of Gapping (a forward reduction). These differences are serious enough to prohibit a collapse of the pair, and they can be laid out as follows.

2.2.1. MAJOR CONSTITUENCY

The gapping examples in (85) are ungrammatical, whereas the parallel backward reduction examples in (86) are grammatical. This indicates that Gapping, but not Backward Conjunction Reduction leaves major constituents behind.

- (85) a. *John is confident of a successful outing and Peter ~~is~~ dependent on ~~a/successful outing/a~~ ~~outing~~.
- *Jan is vol hoop op een goede afloop en Peter ~~is~~ afhankelijk van ~~een/good/af~~ ~~afloop~~.
- b. *John came up with evidence against that proposal and Max ~~adduced/with~~ arguments in support of ~~that/proposal~~.
- *Jan leverde bewijzen tegen dat voorstel en Peter ~~leverde~~ argumenten voor ~~dat/voor~~ ~~stel~~.
- (86) a. John is confident of ~~a/successful outing/at~~ ~~the track~~, and Peter is dependent on a successful outing at the track. (Ross 1967)
- Jan is vol hoop op ~~een/good/af~~ ~~afloop~~ ~~van/de~~ ~~onderneming~~ en Peter is afhankelijk van een goede afloop van de onderneming.
- b. John came up with evidence against ~~that/proposal~~ and Peter adduced arguments in support of that proposal.
- Jan leverde bewijzen tegen ~~dat/voor~~ ~~stel~~ en Peter voerde argumenten aan voor dat voorstel.

It was shown in (41) above that the remnants of Gapping should be major constituents. (86) shows that there is no such restriction on Backward Conjunction Reduction.

2.2.2. THE TARGET OF BACKWARD CONJUNCTION REDUCTION

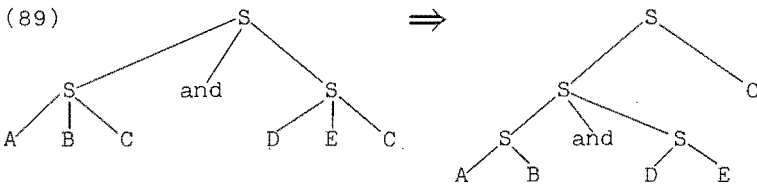
The English rule of Backward Conjunction Reduction is used as a test for constituency by Hankamer (1971, 96), Postal (1974, 125) and Bresnan (1974). It appears that in English the rule deletes one single final constituent. Consider (87) and (88) (Bresnan 1974, 615):

(87) He tried to persuade them ~~that/he/was/right~~, but he couldn't convince them that he was right.

(88) a. *He tried to persuade ~~them/that/he/was/right~~, but he couldn't convince them that he was right.

b. *He tried to persuade ~~the/students/that/he/was/right~~, but he couldn't convince the students that he was right.

For this reason, Backward Conjunction Reduction in English is considered as a Right Node Raising by the linguists mentioned above. The effects of this raising are schematically represented in (89) (Maling 1972, 103):



The particular structural change of (89) might be backed up by the argument that it automatically accounts for the intonational break before the raised node.

The fact that Backward Conjunction Reduction in English is a rule which deletes (or moves) a constituent implies that Backward Conjunction Reduction and Gapping (which deletes variables) cannot be collapsed to one rule in English.

In Dutch, Backward Conjunction Reduction cannot be analyzed as a movement rule, since more than one constituent may be deleted. Consider the examples in (90), in which (res-

pectively) PP plus S', NP plus V plus adverbial S', and NP plus PP are deleted:

- (90) a. Hij heeft niet openlijk verteld ~~aan/hen/dat/hij~~
~~ongelijk/had~~, maar hij heeft wel duidelijk gemaakt
aan hen dat hij ongelijk had.
(He has not publicly told ~~to/them/that/he/wrong~~
~~had/been~~, but he has (adv.) clear made to them
that he wrong had-been)
- b. Het is de gewoonte dat ik voor hem ~~de/kaarten~~
~~schudt/voor/we/beginnen~~ en hij voor mij de kaarten
schudt voor we beginnen.
(It is the custom that I for him ~~the/cards/shuffle~~
~~before/we/start~~ and he for me the cards shuffles
before we start)
- c. Je kunt een beroep doen op ~~die/informatie/bij~~
~~het/beantwoorden/van/die/vraag~~ of gebruik maken
van die informatie bij het beantwoorden van die
vraag.
(You can an appeal make to ~~that/information/in~~
~~answering/that/question~~ or use make of that
information in answering that question)

For this reason, the deletion process illustrated in (90) cannot be considered a Right Node Raising in Dutch. It remains to be explained, of course, why the rules in both languages are different on this point, since in all other respects they are very similar.

2.2.3. ONE TARGET DELETION

Gapping deletes discontinuous parts of coordinated sentences (cf. (91)). Backward Conjunction Reduction is different from Gapping in that it does not delete discontinuously:

- (91) a. Arizona elected Goldwater Senator, and
 Pennsylvania ~~elect~~ Schweiker ~~Senator~~.
 (Jackendoff 1971, 24)
- Arizona koos Goldwater tot president en
 Pennsylvania ~~koos~~ Schweiker ~~tot/president~~.
- b. Max writes poetry in the bathroom and Schwarz
~~writes~~ radical pamphlets ~~in/the/bathroom~~.
 Max schrijft poezie in de badkamer en Schwarz
~~schrijft~~ pamfletten ~~in/de/badkamer~~.
- c. Jack begged Elsie to get married and Wilfred
~~begged~~ Phoebe ~~to/get/married~~.
 Jan vroeg Elsie met hem te trouwen en Wilfred
~~vraag~~ Phoebe ~~met/hem/te/trouwen~~.
- (92) a. * Arizona ~~elect~~ Goldwater ~~Senator~~, and
 Pennsylvania elected Schweiker Senator.
 * Arizona ~~koos~~ Goldwater ~~tot/president~~ en
 Pennsylvania koos Schweiker tot president.
- b. * Max ~~writes~~ poetry ~~in/the/bathroom~~ and Schwarz
 writes radical pamphlets in the bathroom.
 * Max ~~schrijft~~ poezie ~~in/de/badkamer~~ en Schwarz
 schrijft pamfletten in de badkamer.
- c. * Jack ~~begged~~ Elsie ~~to/get/married~~ and Wilfred
 begged Phoebe to get married.
 * Jan ~~vraag~~ Elsie ~~met/hem/te/trouwen~~ en Wilfred
 vroeg Phoebe met hem te trouwen.

2.2.4. ISLAND SENSITIVITY

Unlike Gapping, Backward Conjunction Reduction is not island-sensitive. It presumably obeys the Coordinate Structure Constraint in English (see the ungrammatical example in (93a)), but it violates the Sentential Subject and Complex NP Constraints:

(93) a. Coordinate Structure Constraint:

*Alfonse cooked the beans ~~and/the/rice~~ and Harry cooked the potatoes and the rice.

Alfons kookte bonen ~~en/rijst~~ en Harrie kookte aardappels en rijst.

b. Sentential Subject Constraint:

That Alfonse cooked ~~the/rice~~ and that Harry ate the rice is fantastic.

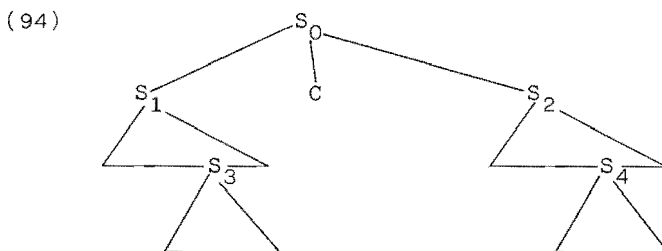
Dat Alfons de rijst ~~opat~~ en dat Harry de aardappels opat is fantastisch.

c. Complex NP Constraint:

Alfonse discussed the question of which rice ~~we/would/eat~~ and Mary discussed the question of which beans we would eat.

Alfons besprak de vraag welke rijst ~~we/zouden~~ eten en Harry besprak de vraag welke bonen we zouden eten.

These comparatively unrestricted applicational possibilities allowed to Backward Conjunction Reduction surface in other embeddings as well. First observe that Gapping only applies to topmost coordinated sentences. Gapping is possible in S_2 under identity with S_1 , but not in S_4 under identity with S_3 in a structure such as (94):



The following examples illustrate this:

- (95) Susan said that her brother was ill and Mary ~~said~~ that her sister was ill.

Susan zei dat haar broertje ziek was en Marie ~~zei~~ dat haar zusje ziek was.

- (96) *Susan said that her brother was ill and Mary said that her sister ~~was/ill~~.

*Susan zei dat haar broertje ziek was en Marie zei dat haar zusje ~~ziek/was~~.

Backward Conjunction Reduction on the other hand deletes elements which are conjunct-final, whether embedded or not:

- (97) *Susan ~~said~~ that her brother was ill and Mary said that her sister was ill.

*Susan ~~zei~~ dat haar broertje ziek was en Marie zei dat haar zusje ziek was.

- (98) Susan said that her brother ~~was/ill~~ and Mary said that her sister was ill.

Susan zei dat haar broertje ~~ziek/was~~ en Marie zei dat haar zusje ziek was.

In this respect, Backward Conjunction Reduction is unparalleled by any rule of sentence grammar. Only a description such as "late stylistic housekeeping rule" seems to approach its characteristics.

2.2.5. THE DOMAINS OF BACKWARD CONJUNCTION REDUCTION

Backward Conjunction Reduction is not restricted in application to a specific domain: it applies to coordinations of all sorts of constituents.

(99) VP:

- a. I am confident of ~~a/successful/outing/at/the/track~~
and dependent on a successful outing at the track.

Ik vertrouw op ~~een/goede/afloop/van/de/onderneming~~
en ben afhankelijk van een goede afloop van de
onderneming.

NP:

- b. John interviewed people who like ~~potatoes~~
and people who dislike potatoes.

Jan ondervroeg mensen die wel ~~van/aardappels~~
~~hielden~~ en mensen die niet van aardappels houden.

PP:

- c. John was standing on a new ~~table~~, or on an old
table.

Jan stond op een nieuw ~~tafel~~ of op een oud
tafeltje.

- d. John jumped over three ~~gates~~ or over four gates.

Jan sprong over drie ~~hekjes~~ of over vier hekjes.

Furthermore, there are no restrictions on the category of the deleted element: in (99) N or NP is deleted, in (98) VPs are, and examples of deletion of other categories are given throughout this section. From this and the other differences between Gapping and Backward Conjunction Reduction enumerated above it follows that the two rules cannot be collapsed. Backward Conjunction Reduction is an extremely awkward rule in that it violates nearly every viable syntactic constraint. In the absence of a sufficiently developed theory of these phenomena we will leave the rule at this undeveloped stage.

3. LIMITATIONS IN DESCRIPTIVE DEVICES

Having shown the independence of the rules of Gapping and Backward Conjunction Reduction, we will in this section substantiate the claim made in the introduction to this chapter, that these rules are the only transformations required in a description of coordination phenomena. First, we will compare the Sentence Conjunction Hypothesis and the Phrasal Conjunction Hypothesis, and will conclude that phrasal conjunction is to be preferred. Second, we will argue that the rules of Forward Conjunction Reduction, Left Peripheral Deletion and Conjunct Movement are unnecessary or inadequate descriptions of the coordination phenomena.

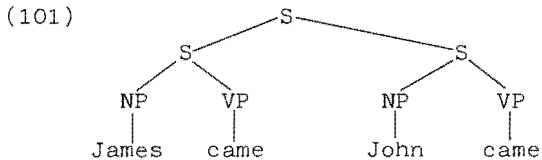
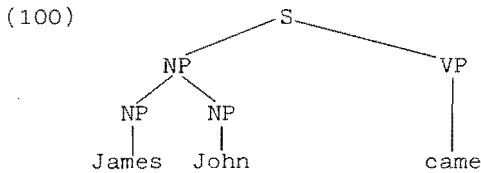
3.1. PHRASAL CONJUNCTION vs. RESTRUCTURING/RELABELING

Generative grammar has always known a certain wealth in its descriptive devices. Transformations exist next to lexical redundancy rules; structure preserving transformations overlap with rewriting rules; rule ordering overlaps with output filters and both obligatory transformations and interpreting rules have a filtering effect. Though the devices available are distinguished a priori (cf. Wasow (1977) for the distinctions between transformations and lexical redundancy rules), it is not always clear that the distinctions offer a significant prediction in the case under study. This state of affairs gives a specific edge to the warning that gross coverage of data as such is of very little interest, since the latter is likely to illustrate merely that the rule system makes only few a priori claims about the data and is vague enough to enumerate the data in some fashion.

In the grammar of coordination we face this problem for the first time as the choice between the Phrasal Conjunction Hypothesis and the Sentence Conjunction Hypothesis (Dougherty 1970-1971). An underlying assumption of the defenders of the latter hypothesis (Tai 1969; Hankamer 1971; Stockwell,

Schachter and Partee 1973) is, that coordination reduction rules cannot be dispensed with if one assumes phrasal conjunction to be generated in the base, and thus that such reduction rules may be formulated in such an unrestricted manner that phrasal conjunctions derive from sentence conjunctions at no extra costs. The base rules may then be restricted in such a way that only the S-label will be allowed to generate conjunctions.

A serious drawback of the Sentence Conjunction Hypothesis is, however, that transformations need to be equipped inevitably with the power of restructuring and relabeling, in order to derive (100) for instance from its underlying form (101) (Tai 1969, 43):



The defenders of the Phrasal Conjunction Hypothesis, on the other hand, argue that phrasal conjunction is needed in deep structure anyway, e.g. in view of sentences such as:

- (102) a. *John forms a curious pair and Mary forms a curious pair.
*Jan vormt een bijzonder paar en Marie vormt een bijzonder paar.
- b. John and Mary form a curious pair.
Jan en Marie vormen een bijzonder paar.

Under the assumption that phrasal coordination constructions are generated directly, they propose to strongly limit (Dougherty 1970-1971, Blom 1975) or completely abolish (Dik 1968) transformational coordination reduction rules. The Phrasal Conjunction Hypothesis suggests at least that restructuring and relabeling of coordinate structures can be ruled out a priori in any generative grammar of a human language.

If we assume phrasal conjunction for all categories as we will do here, the rules of Backward Conjunction Reduction and Gapping are necessary, as argued above, for sentences such as:

(103) John ate ~~a/lot~~ and Peter drank a lot.

Jan at ~~veel~~ en Peter dronk veel.

(104) John drank whisky and Peter ~~drank~~ gin.

Jan dronk whisky en Peter ~~drank~~ gin.

On the other hand, if we assume the rules of Backward Conjunction Reduction and Gapping, phrasal conjunction is necessary as well for sentences such as (105) and (107), since the parallel Backward Conjunction Reduction and Gapping examples are ungrammatical (cf. (106) and (108)).

(105) He tried to persuade and convince them that he was right.

(106) * He tried to persuade ~~them/that/he/was/right~~, and he tried to convince them that he was right.

(107) John ate fresh meat and vegetables.

Jan at verse vleeswaren en groentes.

(108) * John ate fresh meat and Peter ~~ate/fresh~~ vegetables.

* Jan at verse vleeswaren en Peter ~~at/vers~~ groentes.

In some instances, however, phrasal conjunction on the one hand and Backward Conjunction Reduction and Gapping on

the other overlap. Consider (109):

- (109) John sent a bunch of flowers and a pie to Mary.
Jan zond een bos bloemen en een taart aan Marie.

This sentence derives either from phrasal conjunction of NPs in the base, or from a conjunction of VPs (or Ss) by Gapping and Backward Conjunction Reduction:

- (110) John sent a bunch of flowers ~~to Mary~~ and ~~sent~~
a pie to Mary.
Jan zond een bos bloemen ~~aan Marie~~ en ~~zond~~
een taart aan Marie.

This overlap must be considered as a weakness in the present theory.

In the remainder of this section, in order to substantiate our claim that Gapping and Backward Conjunction Reduction are the only two coordination reduction rules, we will show that coordination reduction rules such as Forward Conjunction Reduction and Left Peripheral Deletion are superfluous in an adequate account of coordination reduction phenomena.

3.2. FORWARD CONJUNCTION REDUCTION

Forward Conjunction Reduction is formulated as the mirror image of Backward Conjunction Reduction by Ross (1967, 220). Both rules are collapsed into one Conjunction Reduction rule as in (111):

(111) Conjunction Reduction

$$\begin{array}{ccccccc} \text{a.} & [\text{and} & - & [X & - & A] & _B^n]_B \\ & 1 & & 2 & & 3 & \\ & [1 & & 2 & & \emptyset] & _B \# \quad 3 \end{array} \Rightarrow (\text{OPT})$$

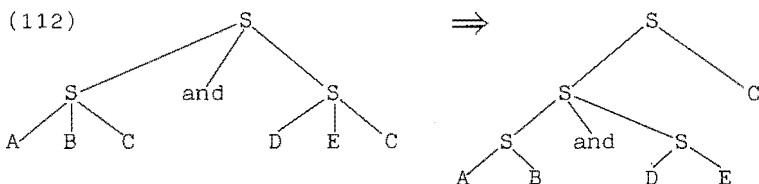
$$\begin{array}{ccccccc} \text{b.} & [\text{and} & - & A & - & X] & _B^n]_B \\ & 1 & & 2 & & 3 & \\ 2\# & 1 & & \emptyset & & 3] & _B \end{array} \Rightarrow (\text{OPT})$$

Condition: all occurrences of A are identical.

Ross adds the following explanation:

"This notation should be interpreted to mean that in any coordinate node of the category B, which dominates any number of conjuncts which are also of the category B, and each of which either ends or begins with a constituent of category A, where all occurrences of A are identical, all of these occurrences of A are superimposed, and adjoined to the conjoined node B."

For Backward Conjunction Reduction, the effects of this are illustrated by (89) (repeated here for convenience).



In contrast with Backward Conjunction Reduction, Forward Conjunction Reduction cannot be shown to introduce coordinations of strings that are not one constituent.

In fact, Ross' Forward Conjunction Reduction must be constrained in such a way that its product might have been generated by phrase structure rules (which may produce coordinations of constituents, but not coordinations of strings of constituents). Examples which do not fit the phrase structure rule schema turn out to be ungrammatical, cf. (113) and (113'):

- (113) a. The University's students are intelligent and
thē/ʋnɪvɛrsɪtɪ/ʃ/ʃtʋdɛntz (are) committed to
freedom. (Ross 1967)

De universitaire studenten zijn intelligent en
dē/ʋnɪvɛrsɪtɛɪrē/ʃtʋdɛntɛn (zijn) gehecht aan hun
vrijheid.

- b. He sells books about flowers and *hē/ʃɛɪlz/ʋɒɒks*
ɒɒɒt poetry.

Hij verkoopt boeken over bloemen en *hɪj/ʋɛrkɒɒt*
ʋɒɒkɛn over poezie.

- c. He sells old books and *hē/ʃɛɪlz/ɒɪd* clothes.

Hij verkoopt oude boeken en *hɪj/ʋɛrkɒɒt/ɒʋdɛ*
kleren.

- d. The old cars and *thē/ɒɪd* bikes of Peter all are
for sale.

De oude auto's en *dē/ɒʋdɛ* fietsen van Peter zijn
allemaal te koop.

- (113') a. *The University's students are intelligent and
thē/ʋnɪvɛrsɪtɪ/ʃ faculty is committed to
freedom.

*De universitaire studenten zijn intelligent en
dē/ʋnɪvɛrsɪtɛɪrē faculteit is gehecht
aan zijn vrijheid.

- b. *Books about flowers are wonderful and
ʋɒɒks/ɒɒɒt poetry are dull.

*Boeken over bloemen zijn prachtig en
ʋɒɒkɛn/ɒʋɛr poezie zijn saai.

- c. *Old books are for sale in Amsterdam and *ɒɪd*
clothes are for sale in The Hague.

*Oude boeken zijn te koop in Amsterdam en *ɒʋdɛ*
kleren zijn te koop in Den Haag.

d. * The old cars of Peter and ~~the/old~~ bikes of Joan
all are for sale.

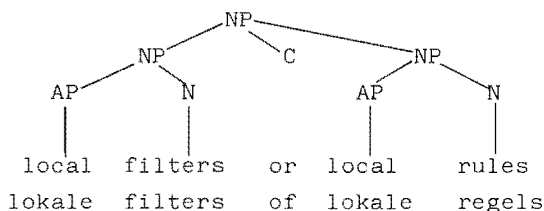
* De oude auto's van Piet en ~~de/oude~~ fietsen
van Jannie zijn allemaal te koop.

It follows that the rule cannot be shown to be necessary, since coordinations of constituents can be generated by phrase structure rules directly, i.e. its structure preserving property suggests that Forward Conjunction Reduction does not exist at all.

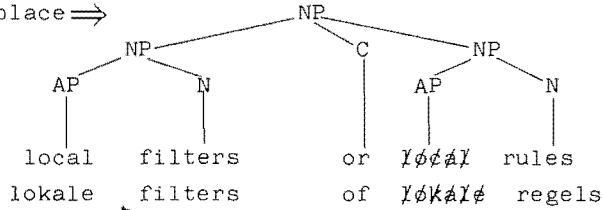
Sentences with initial coordinations form the second set of observations by which Forward Conjunction Reduction becomes implausible. The rule turns out to be inapplicable to initial coordinations, and thus should be complicated so as to exclude them. In these structures, the start of each conjunct is indexed by a coordinator. When frontal elements are deleted by Forward Conjunction Reduction, the effect of this deletion is visible in initial coordination, and the result is an ungrammatical sentence.

This complication is in fact necessary under both variants of Forward Conjunction Reduction imaginable. Thus, the rule can be analyzed either as a raising-and-deletion rule (such as in Ross' formulation cited above), or as a reduction in place. (114) and (115) show the effect of these different assumptions: in non-initial coordination, the output strings are identical in both cases, in initial coordination, they are not:

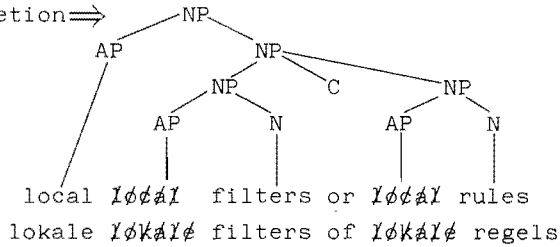
(114) non-initial coordination



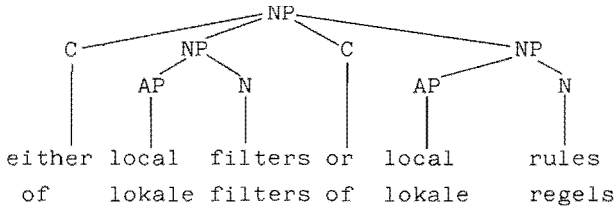
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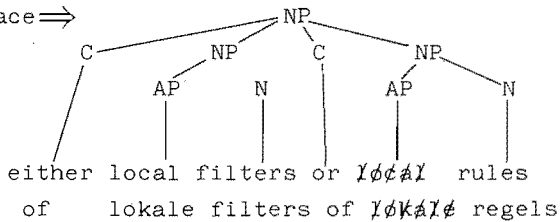
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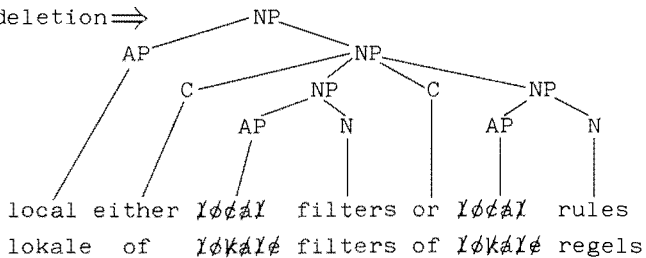
(115) initial coordination



=reduction in place=>



=raising and deletion=>



In initial coordination, both variants of Forward Conjunction Reduction result in ungrammatical outputs. These facts require additional explanation in a grammar with Forward Conjunction Reduction, but follow from a grammar without it.

There is one problem for a theory without Forward Conjunction Reduction, and with phrasal conjunction instead, which deserves mentioning: coordination of a deep structure VP and a derived structure VP appears to be grammatical, cf. (116) (Dougherty 1970, 853). Such sentences can be derived by Forward Conjunction Reduction, but not by phrasal conjunction in the base.

- (116) a. John was hunting lions and was frightened
by snakes.

Jan maakte jacht op leeuwen en werd bang gemaakt
door slangen.

- b. Mary was neither anxious to please nor fun to
squeeze.

Marie was en niet geneigd om aardig te zijn en
niet leuk om mee te praten.

(Mary was both not inclined for kind to be and
not fun for with to talk)

- c. Few writers are both explicit and easy to read.

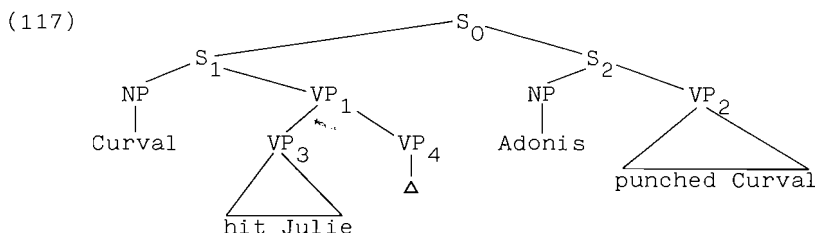
Maar weinig schrijvers zijn zowel expliciet als
gemakkelijk om te lezen.

- d. Curval neither hit Julie nor was punched
by Adonis.

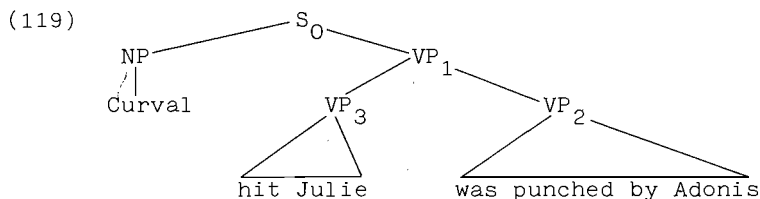
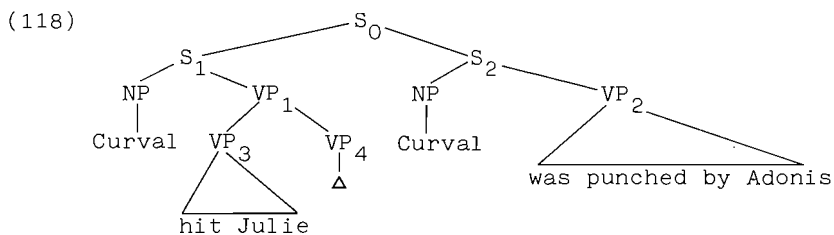
..., dat Curval noch Julia geslagen heeft, noch
door Adonis geduwd werd.

These examples appear to constitute an insurmountable problem for a theory which does not base-generate directly all the VPs in (116) without the application of transformations like Passive and It-replacement. Ways-out have been sketched by Dougherty (1970) and Vergnaud (1974), but both fail to offer a principled account.

Dougherty (1970, 865) assumes that the deep structure of sentences such as (116) looks like (117):



Passive applies to S_2 , which results in (118). Thereafter a Substitution Transformation yields (119):



Although obscured by several tricks, such as the addition of a delta-VP in deep structure, this analysis is equivalent to analyses which make use of relabeling and restructuring rules.

Vergnaud (1974, 51) accounts for (116) by postulating a rule of Subject Deletion or Interpretation. To my knowledge, this rule has no implications beyond (116) and therefore should be considered as an adhoc solution to the problem.

An additional difficulty for both Dougherty and Vergnaud

is that in some instances of (116) auxiliaries are deleted along with the subject. Therefore, more promising solutions are to be expected from theories which base-generate all the VPs in (116), cf. Koster (1978b).⁹

3.3. LEFT PERIPHERAL DELETION

Consider (120):

(120) John gave a book to Mary and a bunch of flowers
to Sue.

Since this sentence cannot be generated by phrase structure rules directly (a book to Mary and a bunch of flowers to Sue do not form one constituent) it seems reasonable to assume that it is derived from a fuller underlying form such as (121) by Gapping:

(121) John gave a book to Mary and ~~(John)/gave~~ a bunch
of flowers to Sue.

This assumption, however, is explicitly rejected by Sag (1976, 203-209). Sag introduces a specific rule for cases such as (121): Left Peripheral Deletion. Unfortunately, he does not present a formulation of the rule, which presumably closely resembles Forward Conjunction Reduction: it deletes leftperipheral constituents of a conjunct only. Along with the introduction of the new rule, Sag gives a more complex factorization to his rule of Gapping. Due to this new factorization, Gapping can be prevented from generating constructions such as (121). The two-step procedure of introducing a new rule (Left Peripheral Deletion) and, at the same time, fixing up an existing rule with a more complex factorization is clearly suspicious.

Sag presents five arguments for not deriving sentences such as (121) by means of Gapping. The conclusion of our review will be that Sag's arguments are too marginal to yield

sufficient support for Left Peripheral Deletion as a rule different from Gapping.

Sag's first argument concerns the phenomenon of preposition deletion. He offers the following examples, in order to show that Left Peripheral Deletion deletes verb plus preposition, but Gapping does not:

(122) a. My mother met with the principal on Thursday and
~~my/mother/met/with~~ the dean on Friday (Sag's
(3.2.7.a))

b. My sister spoke to Mrs. Wimble on Friday and
~~my/sister/spoke/to~~ the dean on Saturday (Sag's
(3.2.7.b))

(123) a. * John spoke to Harry, and Bill ~~spoke/to~~ Mike.
(Sag's (3.2.5.a))

b. * John was happy with his girlfriend, and Betsy
~~was/happy/with~~ her boyfriend (Sag's (3.2.5.b))

Crucially, if the preposition in (122) is deleted by Gapping, it is not clear why Gapping may not delete the preposition in (123). Therefore, Sag assumes that (122) is derived by Left Peripheral Deletion.

At first blush this seems a reasonably structured argument towards the conclusion that the constructions in (122) are not generated by Gapping. It should be added, however, that these constructions (quite unlike (121)) are at the same time stylistically marked. They permit a list reading as suggested by the colons in (124) (for other list phenomena see Milsark (1974, 209)):

(124) a. My mother met with: the principal on Thursday,
and the dean on Friday.

b. My sister spoke to: Mrs. Wimble on Friday, and
the dean on Saturday.

c. ? John was happy with: his boyfriend on Friday,
and his girlfriend on Saturday.

Thus, it is not clear whether such phenomena fall within the proper domain of grammar. They may belong to the "poetic licence" granted to admen and as such should preferably not be used as arguments in support of the claim that (121) (which not necessarily receives a list reading) cannot be an instance of Gapping.

The second argument² centers around the coordinator but (maar in Dutch). Compare (125) and (126).

(125) %*Sandy ate the bagels, but Betsy ~~ate~~ the
creamcheese. (Sag's (3.2.8.))

%*Sandy at de koekjes, maar Betsy ~~at~~ de smeerkaas.

(126) Betsy gave the bagels to Tommy, but ~~gave~~ the
creamcheese to Mike. (Sag's (3.2.9.a))

Betsy gaf de koekjes aan Tommie, maar ~~gaf~~ de
smeerkaas aan Mike.

Deletion of a leftperipheral constituent is grammatical, cf. (126), but deletion of an internal constituent is not, cf. (125). These examples purportedly illustrate that Left Peripheral Deletion applies to coordinations conjoined by but, while Gapping does not. Observe, however, that the unreduced underlying form of (125) is awkward as well. Furthermore, when the examples are selected slightly more felicitously (contrast seems to be important for a conjunction with but), the internal Gapping is grammatical:

(127) a. Some people like bagels, but others ~~like~~
creamcheese.

Sommigen houden van koekjes, maar anderen ~~houden~~
van smeerkaas.

b. Some people go by car, but others ~~go~~ by bike.

Sommigen gaan met de auto, maar anderen ~~gaan~~ met
de fiets.

This implies that a proper description of the peculiarities of but is not illuminated by a distinction between Left Peripheral Deletion and Gapping.

As a third argument, Sag adduces the following ungrammatical instances of Gapping.

- (128) a. * That Alan was late annoyed Betsy, and
that Sandy was late ~~annoyed~~ Bernie.
- b. * For us to appoint Alan would infuriate Betsy,
and for us to appoint Sandy ~~would/infrigate~~
Bernie.

He claims that (p. 206)

"these examples illustrate a constraint on Gapping that has escaped notice in the literature, namely: "Gapping cannot apply after a sentential subject.""

Sag presents no motivation for this rule-specific condition, and it seems difficult to relate it to any of the other features of Gapping.¹⁰

To illustrate that Gapping and Left Peripheral Deletion are different rules, Sag then compares (128) with (129), in which peripheral deletion has applied before a sentential object.

- (129) a. I proved that the sky is blue last Tuesday, and
~~I/proved~~ that the earth is round last Wednesday.
- b. I prefer for you to get the job when I'm drunk,
and ~~I/prefer~~ for Betsy to get the job when I'm
sober.

He concluded that Gapping and Left Peripheral Deletion are different, since one and not the other is influenced by the presence of a sentential phrase.

Sag's observations in this area are not complete. Observe that Gapping may apply after a sentential subject in (130), the passive variants of (129):

- (130) a. That the sky is blue has been proved last Tuesday, and that the earth is round ~~has/been~~ ~~proved~~ last Wednesday.
- b. For you to get the job is preferred by me when I'm drunk, and for Betsy to get the job ~~is~~ ~~preferred/by/me~~ when I'm sober.

This suggests that the explanation of (128) is not related to whether or not the subjects are sentences. It may be that the explanation relates to the rule of Focus Assignment, the relevance of which to Gapping is shown in Sag's section 3.5. Then (128) might be compared with (131):

- (131) * That book, Charles has bought, and that painting, Peter ~~has/bought~~.
- * Dat boek heeft Karel gekocht, en dat schilderij ~~heeft~~ Peter ~~gekocht~~.

One may entertain the hypothesis that the focus pattern of Gapping is incompatible with the focus pattern of stylistically marked sentences, such as (128) and (131) (but not (130)). This causes some Gappings to be low in acceptability. Such examples cannot, therefore, be used to substantiate the claim that Left Peripheral Deletion and Gapping are different rules.

The fourth argument runs as follows (p. 207):

"A fourth difference between these two processes, it seems to me, can be heard in their intonations. As we noted earlier, remnants in Gapped clauses must in general be separated by a pause. Most speakers however, do not require such pauses in cases of left-peripheral ellipsis. (This is left to the reader to verify.) It's of course possible that this has some independent explanation (say within the intonational system), but I take this prosodic disparity to be highly suggestive that two processes are at work here."

This argument, as Sag suggests is by no means conclusive. It may well turn out that intonation is related to the place of the gap. In that case the prosodic differences cannot be used as parameters for different rules.

The fifth observed difference between Gapping and Left Peripheral Deletion relates to the coordinator as well as. The argument crucially depends on the assumption that Gapping applies to coordinations of S only. It runs as follows.

(132) shows that as well as cannot conjoin sentences:

(132) * Tom is happy as well as Dick is sad.

Thus, the grammatical sentence (133) has to have an underlying form with coordinated VPs, and not with coordinated Ss:

(133) I spoke to Betsy on Friday as well as ~~spoke~~ to Sandy on Saturday.

If Gapping applies to conjunctions of S only, (133) cannot be a case of reduction by Gapping. However, Sag does not further support his hypothesis that Gapping applies to coordinations of S only. Hence this argument is without force.

This concludes the discussion of Left Peripheral Deletion. Clearly, the arguments presented by Sag do not convincingly lead to the conclusion that two different forward reduction rules should be incorporated in the grammar.

3.4. CONJUNCT MOVEMENT

Conjunct Movement as proposed by e.g. Ross (1967, 244) derives (134) from the underlying form (135):

(134) Did you tell John about our plans or Peter?

Heb je Jan van onze plannen verteld of Peter?
(Have you Jan of our plans told or Peter?)

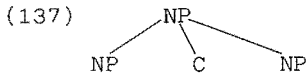
(135) Did you tell John or Peter about our plans?

Heb je Jan of Peter van onze plannen verteld?

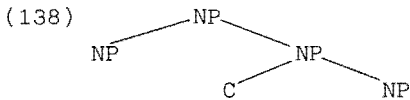
(Have you Jan or Peter of our plans told?)

It is difficult to capture the structural description of Conjunct Movement in any satisfying way. If NP-coordination is generated by phrase structure rule (136), the corresponding structure is (137):

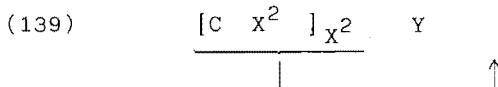
(136) $NP \rightarrow NP \ C \ NP$



(137) has to be restructured into (138) if Conjunct Movement is to move a constituent rather than a string (cf. Ross 1967, 92, and Paardekooper 1971, 360):



In spite of this restructuring, Conjunct Movement needs to refer to the internal structure of the moved item, since only constituents containing a coordinator can move. The rule thus should be formulated with a mixed term, specifying the internal structure of the constituent involved, as in (139):



This is already a serious drawback for a potential rule of Conjunct Movement.

Observe, however, that Conjunct Movement examples can derive from a more fully specified underlying form by Gapping. (134) then derives from (140):

(140) Did you tell John about your plans or did you tell Peter about your plans?

Heb je Jan van je plannen verteld of heb je Peter van je plannen verteld?

If conjunct movement structures are derived by Gapping, there is no need for the intermediate move from (137) to (138) or for reference to the internal structure as in (139). Moreover, it turns out that certain constraints on Conjunct Movement follow from a Gapping analysis. First observe that there is no Conjunct Movement of verbs:

- (141) a. * That dress has been designed by my grandma and made.
* Die jurk is ontworpen door mijn oma en gemaakt.
b. * He either told Peter not to come or wrote.
* Hij heeft Peter of verteld dat hij niet hoefde te komen of geschreven.
(He has Peter either told that he not had to come or written)

Under the Conjunct Movement analysis, (141) would derive from (142):

- (142) a. That dress has been designed and made by my grandma.
Die jurk is ontworpen en gemaakt door mijn oma.
b. He either told or wrote Peter not to come.
Hij heeft Peter of verteld of geschreven dat hij niet hoefde te komen.

and a condition should be added to Conjunct Movement in order to block the rule for verbal constituents. This fact, however, follows automatically from Gapping: this rule always deletes at least the verb.

Second, observe (143):

- (143) a. John is ill and Peter.
 Jan is ziek en Piet.
 b. *John are ill and Peter.
 *Jan zijn ziek en Peter.

Conjunct Movement derives (143) from (144):

- (144) a. *John and Peter is ill.
 *Jan en Peter is ziek.
 b. John and Peter are ill.
 Jan en Peter zijn ziek.

Agreement thus should be ordered before Conjunct Movement. No such ordering is dictated by the Gapping analysis, according to which (143) parallels (145).

- (145) a. John is ill and Peter ~~is~~/ill.
 Jan is ziek en Peter ~~is~~/ziek.
 b. *John are ill and Peter ~~are~~/ill.
 *Jan zijn ziek en Peter ~~zijn~~/ziek.

Third, observe that Conjunct Movement cannot apply to sentences which contain a negation:

- (146) John and Mary didn't win a prize.
 Jan en Marie wonnen geen prijs.
 (Jan and Marie won no prize)
(147) *John didn't win a prize and Mary.
 *Jan won geen prijs en Marie.
 (Jan won no prize and Marie)

How such a derivation should be excluded under the Conjunct Movement assumption remains unclear. In the Gapping analysis, (147) is ungrammatical for the same reason (148) is:

(148) * John didn't win the car, and Mary ~~didn't/win~~ the free trip.

* Jan won de auto niet en Marie ~~won~~ de vakantiereis ~~niet~~.

It is a general feature of Gapping (and presumably of all deletion rules), that negative particles never delete. This entails that purported Conjunct Movement examples can be described by (and their distribution explained by constraints on) Gapping, and that there is no need for restructuring of coordinate structures into (138). Notice finally that the proposed analysis of the so-called conjunct movement examples as cases of Gapping implies that this rule may leave one remnant. This goes against recent proposals by, e.g. Sag (1976) and Zwarts (1978), who suggest that Gapping always leaves two remnants. Since they offer no rationale for this assumption, we may grant the rule the licence allowed here and conclude that, together with Backward Conjunction Reduction, it is the only rule of coordination reduction in the grammar.

FOOTNOTES TO CHAPTER 1

1. For the Dutch observations in this section I am obliged to Paardekooper (1971, 365).
2. It seems reasonable to restrict X in (10) and (11) to projections of lexical categories (N, A, P, V, and Q) only, e.g. in view of the ungrammaticality of (i).

(i) *He is eating apples and or nor pears.

*Hij eet appels en of noch peren.

Coordinators are nonlexical categories, and cannot conjoin (cf. Chomsky 1965, 212, fn.9).

3. This argument was presented at the TIN meeting of 1976, and published in Zonneveld (1978). The same line of argumentation can be construed for German, and perhaps for other European Verb-scrambling languages as well.

4. Manaster-Ramer (1978), in a review of previous arguments pro and con SOV or SVO as the underlying word order for Dutch and German, presents an alleged counterargument to Neijt (1978). This argument is relevant in the present context as well, since Neijt (1978) is a pre-publication of section 1.1. of this chapter.

Manaster-Ramer calls attention to the following example (p. 260):

(i) *Jan en lacht en huult.

(John both laughs and cries)

and continues as follows:

"Neijt's account won't work because clearly lacht and huult are constituents. Neijt (personal communication) has suggested that the right condition allows only some constituent types to conjoin, specifically VPs but not Vs. But the grammaticality of (12) makes that impossible.

(12) Jan zal en lachen en huilen.

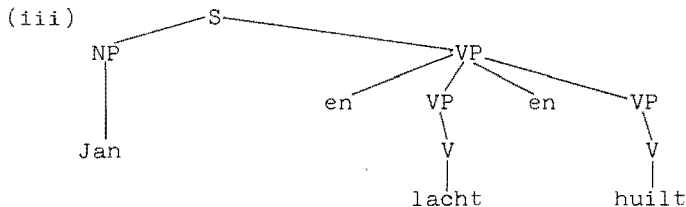
'John will both laugh and cry.'

Without providing an analysis of Dutch conjunctions here (see Manaster-Ramer (forthcoming)). I am surely justified in rejecting Neijt's argument as unconvincing."

As Manaster-Ramer notices, two assumptions are imaginable: the coordination en lacht en huilt is either a coordination of Vs, or a coordination of VPs. If it is a coordination of Vs, nothing follows from my analysis. It is impossible, however, that en lacht en huilt is a coordination of Vs in view of the arguments presented in section 1. Furthermore, in that case it cannot be explained why VP-adverbs, such as hard ('loudly') cannot be placed outside of the initial coordination:

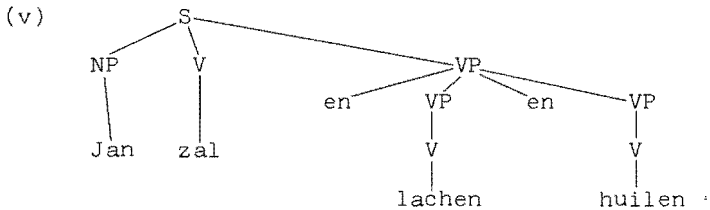
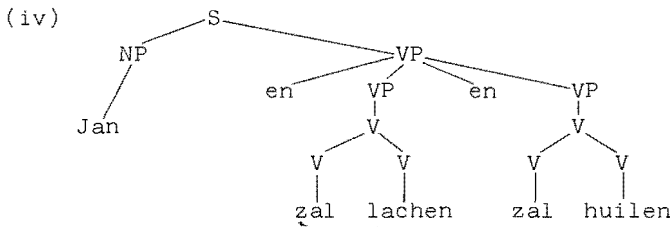
- (ii) * ..., omdat Jan hard en lacht en huilt.
 (... , because John loudly both laughs and cries)

On the other hand, if en lacht en huilt is a coordination of VPs, the pattern of grammaticality cited by Manaster-Ramer follows quite naturally. Verb Preposing is impossible in (i), which is structured roughly as (iii).



En lacht and en huilt do not form one V-node together and therefore cannot be fronted in one swoop (Verb Fronting fronts verbs, not VPs). Across-the-board movement is not possible either: the V-nodes are different.

In (12), on the other hand, across-the-board movement of zal is possible (cf. (iv)), and this application yields (v):



Therefore, I do not see how the grammaticality of this sentence challenges SOV as the underlying word order of Dutch.

5. This condition of Williams' defines the well-formedness of a factor as follows: "If F is a factor and C a coordinate structure containing conjuncts $C_1 \dots C_n$, then for F to be a well-formed factor the following must hold: if for any i , $C_i \in F$ and $C_i \notin F$, then for all i , it must be the case that $C_i \in F$ and $C_i \notin F$.
6. Williams (1977, 102) presents (i) in order to illustrate that Gapping cannot apply across sentences in a discourse.

- (i) A: Did Sam go to the store?
 B: *No, Bill to the supermarket.

Some comments are in order, however, which undermine (i). First, observe that Gapping cannot apply to coordinations of an interrogative and a declarative sentence:

- (ii) *Did Sam go to the store and Bill ~~went~~ to the supermarket.

Second, the introduction of the negative particle No in (i) is clearly relevant to the application of Gapping: (iii) is definitely better than (i):

(iii) A: Sam went to the store.

B: (And) Bill ~~went~~ to the supermarket.

If the gapped sentence is outside of the scope of the negative particle, Gapping is perfect:

(iv) A: Did Sam go to the store?

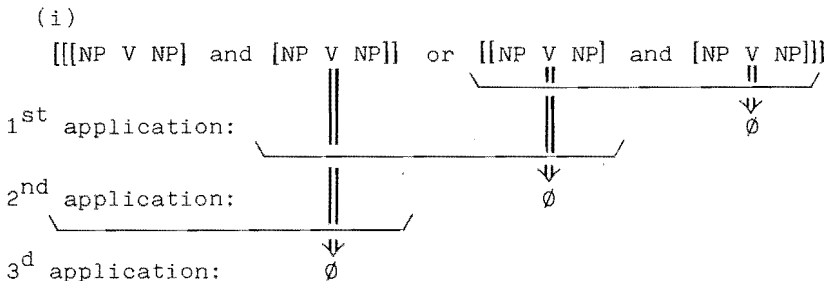
B: No.

A: ~~Did~~ Bill ~~go~~ to the supermarket?

B: Yes.

7. This claim can be clarified as follows.

In order to derive (82), let us assume that the extensive formulation of Gapping applies iteratively from right to left:



The second and third applications combined, however, generate the ungrammatical (83), and there is no non-adhoc way to block this combination of applications.

Alternatively, one may assume that (82) is generated by the following applications:

(ii)

$\underbrace{[[[NP \ V \ NP] \ \text{and} \ [NP \ \underline{V} \ NP]]}_{\Downarrow \emptyset} \ \text{or} \ [[NP \ \underline{V} \ NP] \ \text{and} \ [NP \ \underline{V} \ NP]]$

1st application:

\emptyset

2nd application:

$\underbrace{\hspace{10em}}_{\Downarrow \emptyset}$

3^d application:

\emptyset

In this case, the first and third applications combined yield the ungrammatical (83), and again there seems to be no non-adhoc way to exclude this combination of applications (in fact this is a problem noticed by Williams (1978), cf. (79) and (80) above).

Observe that the second application in (i) and the third application in (ii) are the problematic ones: these applications yield (iii), another ungrammatical sentence:

(iii) *[[[John invited Sue] and [Max invited Mary]]
or [[Max ~~invited~~ Sue] and [John invited Mary]]]

In view of these problems of rule application the extensive formulation of Gapping cannot be motivated by sentences such as:

(iv) *John invited Sue, Peter kissed Mary, and
Max ~~invited~~ Betsy.

since if (iv) cannot be generated because of the structural description of the rule, (82) (cf. structures (i) and (ii)) cannot be generated either. Therefore, the identification of the missing part of gapped sentences is a problem not to be solved by the formulation of the rule.

8. Cf. Sag (1976, 115), who advocates a small-scale formula of VP-deletion.
9. From this analysis it follows that transformations and interpretive rules differ as regards across-the-board applicability. Transformations need to apply in an across the-board fashion, cf.:

- (i) What_i did Harry eat e_i and Bill drink e_i?
(ii) What_i did Harry eat e_i and Bill drink beer?

Interpretive rules such as Passive and It-replacement need not apply in an across-the-board fashion, cf.:

- (iii) Curval_i hit Julie and was punched e_i by Adonis.
- (iv) Few writers_i are both explicit and easy to read e_i

The latter thus resemble clear-cut instances of interpretive rules, such as Reflexivization:

- (v) John_i fed the dog and washed himself_i.

10. However, cf. the Predicate Deletion Constraint (Kuno 1973, 376).

CHAPTER 2.

The Rule of Gapping

This chapter is subdivided into three parts. The first section reconsiders the formulation of the rule of Gapping for English by Hankamer (1973), Stillings (1975) and Langendoen (1975). Partly with the aid of Kuno (1976), it will be found that none of these three proposals adequately explains the phenomenon of Gapping in English. The second section concerns our own formulation of the rule of Gapping. The rule will receive a very general formulation, with little or no specific restrictions. It is claimed that the restrictions required follow from independently motivated constraints only. This will be demonstrated partly in the third section on the basis of the requirement of recoverability of deletion. Following Sag (1976), it will be argued that several features of Gapping are predictable given a precise formulation of the notion of "identity".

1. EARLIER RULES OF GAPPING

1.1. HANKAMER'S UNACCEPTABILITY

The precise formulation of the rule of Gapping is left unclear in Hankamer (1971). However, in Hankamer (1973, 18) the author presents the following formulation:

(1) Gapping

$NP\ X\ A\ Z\ \text{and}\ NP\ X\ B\ Z \longrightarrow NP\ X\ A\ Z\ \text{and}\ NP\ B$

where A and B are nonidentical major constituents.

This rule formula is possibly due to Ross, to whom Hankamer refers, though the notion of "major constituency" is certain-

ly due to Hankamer. It is defined as (Hankamer 1973, 18, fn. 2):

"A 'major constituent' of a given sentence S_0 is a constituent either immediately dominated by S_0 or immediately dominated by VP, which is immediately dominated by S_0 ."

Let us refer to the condition that the remnants of Gapping be major constituents as the Major Constituent Condition. This condition functions as an effective constraint on possible remnants. It prevents (1) from deleting more than allowed in (2), for instance:

(2) John took Bill's red shoes and

Max	took Bill's blue hat. *took/Billy's blue hat. *took/Billy's/red hat.
-----	---

The focus of Hankamer's article (1973, 29) is the following No-Ambiguity Condition:

(3) The No-Ambiguity Condition

Any application of Gapping which would yield an output structure identical to a structure derivable by Gapping from another source, but with the "gap" at the left extremity [of the gapped conjunct] is disallowed.

As pointed out by Hankamer, the No-Ambiguity Condition is a transderivational constraint. Because it is possible to derive strings such as (4), the No-Ambiguity Condition excludes the superficially identical, but differently structured strings in (5).

(4) a. Bill expects Harry to find the way to the party,
and ~~Billy/expects~~ Sue to find the way home.

b. Jack wants Mike to wash himself and
~~Jack/wants~~ Arnie to shave himself.

- c. Max wanted Ted to persuade Alex to get lost and
Max/wanted Walt to/persuade Ira to/get/lost.
 - d. Max wanted to put the eggplant on the table, and
Max/wanted/to/put Harvey in the sink.
- (5) a. *Bill expects Harry to find the way to the party,
and Sue expects/Harry to find the way home.
- b. *Jack wants Mike to wash himself, and
Arnie wants/Mike to shave himself.
 - c. *Max wanted Ted to persuade Alex to get lost, and
Walt wanted Ira to/persuade/Alex/to/get/lost.
 - d. *Max wanted to put the eggplant on the table, and
Harvey wanted/to/put/the/eggplant in the sink.

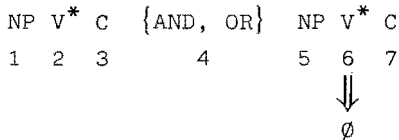
The No-Ambiguity Condition characterizes an intriguing set of data in a revealing way. This is not sufficient, however, to accept this transderivational condition in the grammar. New devices such as e.g. transformations vs. rewriting rules, or filters vs. rule ordering and rule obligatoriness, or traces vs. global formulations of rule conditions, are accepted if they involve general simplifications in the format of other rule types, and if, moreover, each specimen of the new device is independently motivated by solving problems with more than one rule or principle.

These heavy restrictions on new devices are justified as long as one takes linguistics as an attempt to explain the learnability of natural language, i.e. as an enterprise controlled by an underlying reality rather than a more or less free wheeling characterization of an intuitively appreciated coherence between linguistic data. Stillings (1975) and Langendoen (1975) attempt to reformulate the No-Ambiguity Condition in more acceptable terms. Both attempts fail, however, and it seems instructive to show why.

1.2. STILLINGS 1975

As noted above, it is the difference between (4) and (5) that led Hankamer to propose the No-Ambiguity Condition. Stillings (1975) makes the observation that the gap in the ungrammatical sentences of (5) originally contained a NP constituent, whereas the gap in (4) did not (disregarding for a moment the initial subject NP). As a more restricted formulation of Gapping, she therefore proposes (6) (p. 257):

(6) Gapping



In this rule, C is a constituent variable, defined as follows (p. 252):

"Multiple occurrences of the constituent variable C must be expanded in the same way when the rule schema in which they occur is expanded into one of the rules which it abbreviates."

By this definition, rule (6) is an abbreviation of the following set of rules:

- (7) a. NP V* S {AND, OR} NP V* S
 \Downarrow
 \emptyset
- b. NP V* NP {AND, OR} NP V* NP
 \Downarrow
 \emptyset
- c. NP V* PP {AND, OR} NP V* PP
 \Downarrow
 \emptyset
- etc.

If C is not expanded twice in the same way, the result of the application of Gapping is ungrammatical as can be observed from (8):¹

- (8) a. *Fred eats at Arby's, and my brother-in-law
~~eats~~ pickled beets.
 b. *Prickly pears grow slowly, and Asiatic Dayflowers
~~grow~~ in Leverett.

The notation V* in (6) represents a particular type of variable (used for the first time in Bresnan 1971, 266), one which contains verbs only. The rule of Gapping is thereby allowed to delete a set of adjacent verbs (Stillings 1975, 253), cf.:

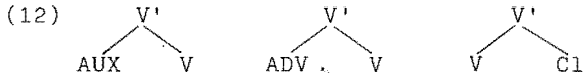
- (9) Abodeefa attempted to learn to play "Klactoveedsed-
 steen" and Miles
- | |
|---|
| attempted to learn to play "Koko".
attempted /to/learn to play "Koko".
attempted /to/learn/to/play "Koko". |
|---|

By this restriction on the contents of the gap, Stillings evades the derivation of (5), and obviates the need for the No-Ambiguity Condition.

There are cases where the gap involves constituents other than V, such as: the infinitive particle to (cf. (9)); preverbal adverbs (cf. (10), Jackendoff 1971, 23); and postverbal clitics (cf. (11), Jackendoff 1971, 24), as in:

- (10) a. Simon quickly dropped the gold and Jack
~~quickly~~/dropped the diamonds.
 b. Max sometimes beats his wife and Ted
~~sometimes~~/beats his dog.
 (11) Paul Schachter has informed me that the basic order in Tagalog and related languages is VOS; Ives Goddard ~~has~~/informed/me that the unmarked order in Algonkian is OVS; and Guy Carden ~~has~~/informed/me that the basic order in Aleut is OSV.

Here, Stillings assumes restructuring into (12). (She does not mention AUX-V restructuring explicitly, but it is in line with her approach of non-V Gapping in general.)

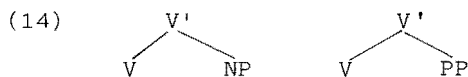


This assumption successfully predicts that the elements mentioned have to be part of the gap, just like V, and cannot belong to the set of possible remnants:

- (9') *Abodeefa attempted to learn to play "Klactoveedsed-steen" and Miles $\left\{ \begin{array}{l} \text{at} \text{t} \text{e} \text{m} \text{p} \text{t} \text{e} \text{d} / \text{t} \text{o} \text{ l} \text{e} \text{a} \text{r} \text{n} \text{ t} \text{o} \text{ p} \text{l} \text{a} \text{y} \text{"Koko"} \\ \text{at} \text{t} \text{e} \text{m} \text{p} \text{t} \text{e} \text{d} / \text{t} \text{o} / \text{l} \text{e} \text{a} \text{r} \text{n} / \text{t} \text{o} \text{ p} \text{l} \text{a} \text{y} \text{"Koko"} \end{array} \right.$
- (10') a. *Simon quickly dropped the gold and Jack suddenly ~~dr~~opped the diamonds.
- b. *Max sometimes beats his wife and Ted frequently ~~be~~ats his dog.
- (11') *Paul Schachter has informed me that the basic order in Tagalog and related languages is VOS; Ives Goddard ~~has~~/infor~~me~~d me that the unmarked order in Algonkian is OVS; and Guy Carden ~~has~~/infor~~me~~d me that the basic order in Aleut is OSV.

Less promising candidates for restructuring are full NP and full PP, although such restructuring is required for (13) (Jackendoff 1971, 24), structured as in (14):

- (13) a. John writes poetry in the garden, and Max ~~wr~~ites/~~p~~oes~~try~~ in the bathroom.
- b. Charlie went into the bedroom at 5:30, and Lola ~~w~~ent/~~i~~nto/~~t~~he/~~p~~ed~~r~~oom at 5:31.



The restructuring approach breaks down definitely in those cases where Gapping involves constituents not adjacent to the verb:

- (15) a. Jack begged Elsie to get married, and Wilfred
begged Phoebe to get married.
- b. I learned to ride last week, and Bill
learned to row last week.
- c. I told Sue about the party, and Bill
told Martha about the party.
- d. Joe covered the floor with red paint, and Alice
covered the walls with red paint.
- e. Joe painted his boat red, and Alice
painted her car red.
- f. Hank hit a home run on Thursday, and Maris
hit a single on Thursday.

In order to generate these sentences, Stillings introduces the rule of "Truncation", deleting conjunct final constituents. The rule is left unformulated. The reduced sentences in (15) are derived from their full underlying forms via (16), the Truncation stage:

- (16) a. Jack begged Elsie to get married, and Wilfred
begged Phoebe to get married.
- b. I learned to ride last week, and Bill learned
to row last week.
- c. I told Sue about the party, and Bill told
Martha about the party.
- d. * Joe covered the floor with red paint, and Alice
covered the walls with red paint.
- e. * Joe painted his boat red, and Alice painted
her car red.
- f. Hank hit a home run on Thursday, and Maris hit
a single on Thursday.

However, as (16d) and (16e) show, Truncation is impossible for obligatory constituents. This implies that (15d) and (15e) are real examples of multiple gapping, and that Truncation does not cover all instances of (15). A comparatively interesting conclusion is that it does not cover any of these cases, but that the rule of Gapping must be formulated so as to derive the whole set in (15).

In favor of her analysis Stillings presents (17), a set of multiple gap examples which must definitely be excluded:

- (17) a. *Al was clearly intent on telling Alice to buy the lettuce and Alfred ~~was/clearly/intent/on/telling~~ Jim ~~to/buy/the/lettuce~~.
- b. *Nancy thought Mike foolish for even talking to Sally and Cindy ~~thought~~ Alfonse ~~foolish/for/even talking/to/Sally~~.
- c. *John asked George to be the one to inform Mary of Ellington's death and Fred ~~asked~~ Sam ~~to/be/the one/to/inform/Mary/of/Ellington's/death~~.
- d. *The box certainly contained thumbtacks before Marty spilled them and the carton ~~certainly contained~~ pins ~~before/Marty/spilled/then~~.
- e. *I plan to talk to Mary a week from next Tuesday and John ~~plans/to/talk~~ to Fred ~~a/week/from/next Tuesday~~.
- f. *Arthur put his boa constrictor under the mattress at 80 W. Warren and Bernie ~~put~~ plywood ~~under/the mattress/at/80/W/Warren~~.

These examples are not excluded by the Gapping analyses of Hankamer (1971), and Sag (1976) (whose proposal will be discussed in section 2). However, it is not clear how (17) is excluded in Stillings' framework. In particular, she presents no reason why Truncation cannot apply to it. In chapter 3 it will be shown that (17) is in fact irrelevant to the formulation of Gapping, but pertains to the scope of rules in

general. This strengthens the conclusion that (15) are cases of multiple Gapping.

1.3. LANGENDOEN 1975

Just as Stillings (1975), Langendoen (1975) presents an alternative to Hankamer's transderivational constraint by means of a direct restriction on the gap:

(18) The nonleft-peripheral NP condition

Coordination Deletion cannot apply so as to delete nonleft-peripheral strings that contain NP.

No doubt an attractive feature of this condition is that it predicts ungrammatical gappings irrespective of a left-peripheral gap. The examples in (19) and (20) are excluded since either the internal gap or the right-peripheral gap contains a NP. In those cases where all deleted NPs are left-peripheral, the reduction is grammatical, cf. (19') and (20') (Langendoen 1975, 113 - 4).

(19) *Max sent Sally the messenger last week, and

~~Max/sent~~ Susan ~~the/messenger~~ yesterday.

(20) a. *Max wanted Ted to persuade Alex to see Mary,

and ~~Max/wanted~~ Walt ~~to/persuade~~ Ira ~~to/see~~ Mary.

b. *Max wanted Ted to persuade Alex to see Mary,

and ~~Max/wanted~~ Walt ~~to/persuade~~ Alex ~~to/see~~ Ira.

(19') Max sent Sally the messenger last week, and

~~Max/sent~~ Susan yesterday.

(20') Max wanted Ted to persuade Alex to see Mary, and

~~Max/wanted/Ted/to/persuade~~ Walt ~~to/see~~ Ira.

The Nonleft-peripheral NP Condition runs aground, however, on precisely the same examples as Stillings' analysis of Gapping-cum-restructuring-and-Truncation (cf., again, Jackendoff 1971, 24):

- (21) a. John writes poetry in the garden and Max
~~writes/poetry~~ in the bathroom.
 b. Arizona elected Goldwater Senator and
 Pennsylvania ~~elected~~ Schweiker ~~Senator~~.
 c. John gave Mary a nickel and Susan
~~gave~~ Harvey ~~a/nickel~~.

For these phenomena there does not seem to be a solution that does not meet the problems discussed in the preceding section.

Moreover, Langendoen's Nonleft-peripheral NP Condition is acceptable only if it is taken as a part of Universal Grammar. As such, the condition is hard to criticize, although its isolated character does certainly not count in favor of it.

1.4. KUNO 1976

Kuno (1976) presents a set of interesting counterexamples to Hankamer's No-Ambiguity Condition discussed in section 1.1. All these counterexamples have straightforward parallels in Dutch (cf. Kuno (1976, 306) for the English examples):

- (22) My brother visited Japan in 1960, and my sister
~~visited/Japan~~ in 1961.

Mijn broer bezocht Japan in 1960 en mijn zus
~~bezocht/Japan~~ in 1961.

- (23) Harry told this story to his mother, and Tom
~~told/this/story~~ to his father.

Harrie vertelde dit verhaal aan zijn moeder en Tom
~~vertelde/dit/verhaal~~ aan zijn vader.

These sentences are grammatical, although variants exist with a left peripheral gap (which for (23) are semantically anomalous):

(22') My brother visited Japan in 1960 and
~~my/brother/visited~~ my sister in 1961.

Mijn broer bezocht Japan in 1960 en
~~mijn/broer/bezocht~~ mijn zus in 1961.

(23') *Harry told this story to his mother, and
~~Harry/told~~ Tom to his father.

*Harry vertelde dit verhaal aan zijn moeder en
~~Harry/vertelde~~ Tom aan zijn vader.

Moreover, Kuno's most important observations make clear that factors outside of syntax may influence the grammaticality judgments on sentences of this type. For instance, the lexical content of the NPs involved seems to play a crucial role (p.307). Compare the a- and b-instances of (24), (25), and (26), which parallel Hankamer's basic set in (4) and (5) above.

(24) a. *John believes Mary to be guilty, and Tom
~~believes/Mary~~ to be innocent.

b. Of the people polled, 80% believe the President
to be guilty, and 20% ~~believe/the/President~~
(to be) innocent.

(irreproducible in Dutch)

(25) a. *Jack asked Mike to wash himself, and Sue
~~asked/Mike~~ to shave himself.

*Jack vroeg Mike zichzelf te wassen en Sue
~~vroeg/Mike~~ zichzelf te scheren.

b. 50% of his constituents asked the Senator
to vote for the bill, and 25% ~~asked/the/senator~~
to vote against it.

? 50% vroeg het kamerlid voor de wet te stemmen
en 25% ~~vroeg/het/kamerlid~~ ertegen ~~te/stemmen~~.
(50% asked the senator for the bill to vote
and 25% ~~asked/the/senator~~ there-against ~~to/vote~~.)

(26) a. * Max wanted Ted to persuade Alex to see Mary
and Walt *wantēd* Ira *tō/perswādē/Alex/tō/see/Mary*.

? Max wilde Ted Alex laten overhalen om Mary
op te zoeken en Walt *wylde* Ira *Alex/latēn*
overtuālēn/om/Mary/ōp/tē/zoekēn.

(Max wanted Ted Alex let persuade for Mary
up to look and Walt *wantēd* Ira *Alex/lēē*
perswādē/tōr/Mary/ūp/tō/look.)

b. Some Republicans want Ford to run for the
Presidency in 1976, and others *want* Reagan
tō/run/tōr/tēē/presidēncy/in/1976.

Sommige Republikeinen willen Ford lijsttrekker
laten worden en anderen *wilyēn* Reagan
lijsttrekkēr/latēn/wōrdēn.

(Some Republicans want Ford candidate
let be and others *want* Reagan
cāndidātē/lēē/bē.)

In the same vein, if the context clearly shows that constitu-
ents containing old information have been gapped, whereas
constituents with new information are left behind, the output
is grammatical irrespective of the lexical content of the
NPs. Kuno (p.308) demonstrates this by presenting a question,
which precedes the gapped answer:

(27) a. Q: With what did John and Bill hit Mary?

A: Jōhn hit Mary with a stick and Bill
hit/Mary with a belt.

Q: Waarmee sloegen Jan en Bill Marie?

(Wherewith hit Jan and Bill Marie?)

A: Jān sloeg Marie met een stok en Bill
sloeg/Mariē met een riem.

b. Q: Where did Max and Harvey want to put the
eggplant?

A: Max wanted to put the eggplant on the table and
Harvey *wantēd* *tō/put/tēē/eggplant* in the sink.

(27) b. (cont.)

Q: Waar wilden Max en Harry de komkommerplant
neerzetten?

(Where wanted Max and Harry the eggplant
(to) put?)

A: Max wilde de komkommerplant op tafel zetten en
Harry ~~wilde/de/komkommerplant~~ op het aanrecht
~~neerzetten~~.

(Max wanted the eggplant on table (to) put and
Harry ~~wanted/de/eggplant~~ in the sink
~~to/put~~.)

The implication of Kuno's observation is that the facts covered by the No-Ambiguity Condition are not to be accounted for in syntax. The alternatives presented by Stillings and Langendoen are syntactically superfluous. Although it is easy to be wise after the event, the general conclusion seems to be that the devices proposed by Stillings and Langendoen catch up with the facts presented by Hankamer, but lack independent support in a striking way.

2. DESCRIPTIVE ADEQUACY

Chomsky's criticism (1964, 29) that "[m]odern linguistics has been largely concerned with observational adequacy" disguises a significant problem. Let us suppose that the study of distributional phenomena along the lines suggested by De Saussure and Bloomfield was directed toward the construction of categories, each of which could be checked more or less directly by its own set of observations. Such studies had to be largely concerned with observational adequacy, since this could be seen as a direct measure for descriptive adequacy. The closeness to observational reality was probably valued as a hallmark of scientific "certainty", a safeguard against not directly controllable speculation.

These very virtues caused this type of study to fall into disrepute. Taxonomies of observations without unexpected

implications, incapable to anticipate the variety of grammatical patterns were inadequate to portray the competence by which the fluent speaker judges the grammaticality of sentences he has not heard before. By these standards grammatical notions should not be harmless generalizations, each reducible to its own set of observations. Grammatical notions would have a diversity of implications, due to mutual influence. In brief, they should be "independently motivated". The set-up and outlook of the Chomskyan approach is so completely different that any attempt to see it as a continuation of "American" linguistics seems a mental exercise of a doubtful kind, deemed to miss the major point and to mistake certain crucial characteristics for additional properties. And, if even undisputably clear observations can offer only a tentative check on categories and rules, it is clear that the new hallmark of linguistic soundness, that is: "independent motivation", is indispensable.

The relevance of any specific proposal is tentative and only intuitively appreciated as "revealing" or "significant". This is a general problem, which exists for the Gapping phenomena as well. It is not a priori clear what should be derived by phrasal conjunction, or how many reduction rules are to be assumed (for the relevance of these rules with respect to Gapping, see chapter 1). It is worth illustrating that Stillings (1975) and Sag (1976) were well-aware of this. Stillings admits of her rule (p. 270) that

"while it does not generate all of the gapped sentences which are grammatical, e.g., sentences (A1-6) i.e. (16) above, at least it generates only grammatical gapped sentences."

This view contrasts with Sag's, who summarizes his position as follows (1976, 279):

"The proposed analysis overgenerates considerably, which, we have argued, is a desirable result."

Both positions imply further hypotheses. Stillings is forced to claim that the gapped sentences not generated will follow naturally from some other independently motivated rule. Sag claims that the incorrect gaps which his rule generates are

filtered out by independently motivated principles. In both cases, there is no a priori observational adequacy to decide the question.

We will follow here Sag's preference of "overgeneration", i.e. the preference of syntactic rule schemata with little or no specific information, whose overproduction is filtered out by another rule component, in particular the semantic component. A description that results from the interaction of rule components is sometimes indicated as the "modular" approach. It is a most promising form of "independent motivation". We will carry through Sag's strategy of overgeneration, however, with determined rigor. The formulation of the rule of Gapping to be proposed contains no rule-specific information whatsoever. Restrictions are seen to follow from semantic conditions along the lines of Sag, or from syntactic conditions that are not rule-specific (cf. chapter 3 below). To motivate our formulation of the rule, three aspects of previously proposed formulations of the rule of Gapping will be discussed here:

- (i) the domain of the rule;
- (ii) the specification of the remnants; and
- (iii) the number of gaps.

These aspects will be discussed in the following 3 sections in the order given.

2.1. THE DOMAIN OF THE RULE

One of the most important observations as regards the domain of Gapping is that the rule can apply in embedded domains, cf. the following examples (Sag 1976, 267):

- (28) a. Bill said that Betsy played shortstop, and Alan
~~played~~ 1st base.

Bill zei dat Betsy korte stop zou zijn en Alan
 eerste honkman ~~zou zijn~~.

(Bill said that Betsy short stop would be and Alan
 first base ~~would be~~.)

- b. That Alan played 1st base and Betsy
~~plāy#d~~ shortstop, is not surprising.

Dat Alan eerste honkman was en Betsy korte stop
~~w#s~~, verbaast me niets.

(That Alan first base was and Betsy short stop
~~w#s~~, surprises me nothing.)

Sag (1976) assumes that all deletion rules apply after the level of shallow structure. For Gapping then to apply to (28), end-variables should be added to the structural description of the rule. Together with these end-variables (W_3 and W_4) Sag introduces S-brackets. The rule of Gapping following from this is (29).

(29) Gapping (Sag 1976, 278)

$$W_3 - [S X^2 - W_1 - (X^2)^* - W_2] - \{ \text{and, or} \} - [S X^2 - W_1 - (X^2)^* - W_2] - W_4$$

1	2	3	4	5	6	7	8	9	10	11	\Rightarrow
1	2	3	4	5	6	7	\emptyset	9	\emptyset	11	

In this rule, W is a true variable (any number of constituents) and X^2 abbreviates for constituents with two bars, thus N^2 (=NP), P^2 (=PP), A^2 (=AP), and V^2 (=VP) (cf. Bresnan 1976 for the formulation of rules with variable constituents). The stars over terms 4 and 9 indicate that the terms may contain an arbitrary number of X^2 -constituents.

Sag does not explain the introduction of S-brackets, but their effect is evident. Since it is generally agreed that the use of brackets in transformational rules must be avoided, they should be considered a subject of further study rather than a solution to the problem.

Moreover, as shown in chapter 1, not only does Gapping apply to coordinations of S , but to coordinations of S' and VP as well. For the rule to be observationally adequate, a more sophisticated specification of the domain should be provided. This can be done by adding V^i -brackets to the structural description of the rule, where V^i abbreviates for projections of V (S' , S , and VP). It excludes the derivation

of (30), in which Gapping applies to a coordination of NPs (cf. chapter 1, section 2.1.5.).

(30) *The third attempt to begin to write a novel and
the fourth ~~attempt~~/to/begin/to/write a play, ...

*De derde poging om te beginnen een novelle te
schrijven en de vierde ~~poging~~/om/te/beginnen
een toneelstuk ~~te/schrijven~~, ...

(The third attempt for to begin a novel to
write and the fourth ~~attempt~~/for/to/begin
a play ~~to/write~~, ...)

On the level of explanatory adequacy, however, this description is suspicious. The language learning child has no access to negative data such as (30). Of course, the V^i -domain specification can be claimed to be innate. I prefer to leave the domain unspecified in the expectation that restrictions on it are to be explained by independent constraints. In section 3 I will propose to derive such a constraint from restrictions on Logical Form. Another possibility is to derive it from the syntactic Major Constituent Condition to be discussed in chapter 3.

2.2. THE REMNANTS

The rules of Gapping presented by Hankamer and Stillings express two characteristics of the remnants: first, the rules restrict the number of their remnants, and second: all kinds of constituents may function as second remnants, but only NP may be a first remnant. The first restriction specifies the number of remnants allowed: the upper limit is two. Though this restriction is correct for English in some instances (cf. (31)), it is not in others (cf. (32)) (Sag 1976, 196-7), and it does not hold in Dutch at all:

- (31) a. * Alan gave Sandy a book, and Peter
~~gave~~ Betsy a magazine.

Alan gaf Sandy een boek en Peter
~~gaf~~ Betsy een tijdschrift.

- b. * Alan told Harry that the sky was falling and Sam
~~told~~ Betsy that Chicken Little was right.

Alan vertelde Harry dat de lucht naar beneden
kwam en Sam ~~vertelde~~ Betsy dat Chicken Little
gelijk had.

(Alan told Harry that the sky down-below
came and Sam ~~told~~ Betsy that Chicken Little
right was.)

- c. * Arizona elected Goldwater Senator and
Massachussetts ~~elected~~ McCormack Congressman.

Arizona koos Goldwater in de senaat en
Massachussetts ~~koos~~ McCormack in het congres.
(Arizona elected Goldwater in the senate and
Massachussetts ~~elected~~ McCormack in the congress)

- (32) a. Peter talked to his boss on Tuesday, and Betsy
~~talked~~ to her supervisor on Wednesday.

Piet heeft dinsdag met zijn baas gesproken en
Betsy ~~heeft~~ woensdag met haar werkleider
~~gesproken~~.

(Piet has Tuesday to his boss talked and
Betsy ~~has~~ Wednesday to her supervisor
~~talked~~.)

- b. John talked to his supervisor about his thesis,
and Erich ~~talked~~ to the dean about departmental
politics.

John heeft met zijn werkleider over zijn proef-
schrift gesproken en Erik ~~heeft~~ met de dekaan
over instituutszaken ~~gesproken~~.

It seems that in English gapped sentences with more than two remnants are acceptable only if the third remnant is outside of the VP. Sag considers this restriction unimportant (p. 278):

"Much of the overgeneration of this rule [i.e. (29), A.H.N.] can be ruled out by a surface constraint of the sort illustrated in (3.4.53)

(3.4.53) $*[{}_S x^2 [{}_V^1 x^2 - C^*]]$,

where C^* stands for any sequence of constituents (within V^1 (VP)). As previously mentioned, judgements vary considerably among speakers. Thus some people accept sentences like (3.4.54), whose Gapped right conjunct has the structure: $[{}_S N^2 [{}_V^1 N^2 S^2]]$.

(3.4.54) %Janis told Alan that he was crazy, and Betsy
~~that~~ Peter that he should go to take a bath.

Our Gapping rule generates such sentences. The idiolectal variation is handled by positing slightly different surface constraints. This, I would claim, is a very natural way to handle what seem to be completely idiosyncratic differences in acceptability judgements."

Let us assume that this is correct. Then the difference between English and Dutch with respect to the Gapping phenomena observed in (31) are reduced to the fact that filter (3.4.53) is part of the grammar of English (at least for some speakers), but absent from the grammar of Dutch.

Secondly, the rules of Hankamer and Stillings specify the first remnant of Gapping as NP. This restriction arbitrarily narrows the scope of the rule. Sag (1976, 265) shows that the choice of the first remnant is just as free as the choice of the second remnant, cf.:

(33) a. At our house, we play poker, and
 at Betsy's house, ~~we play~~ bridge.

(33) a. (cont.)

Bij ons spelen we poker, en
 bij Betsy ~~spelen~~/~~we~~ bridge.
 (At our ('s) play we poker, and
 at Betsy ('s) ~~play~~/~~we~~ bridge.)

b. Yesterday we went to the movies, and
 last Thursday, ~~we~~/~~we~~ to the circus.

Gisteren gingen we naar de film en
 vorige week donderdag ~~gingen~~/~~we~~ naar het circus.
 (Yesterday went we to the movies and
 last week Thursday ~~went~~/~~we~~ to the circus.)

One's choice of remnants is, however, not completely free. In particular, V^2 may not be left behind (Sag 1976, 266):

(34) *On Tuesday, Sam must have seemed happy, and
 on Wednesday, ~~he~~ must have seemed sad.

Sag concludes that the second X^2 in his rule

"must be restricted so that it cannot analyze V^2 . This would presumably be done by means of syntactic features, but we will not pursue that matter here."

It seems, however, that a solution in terms of syntactic features only obscures a fundamental problem regarding Gapping. It cannot be accidental that Gapping always deletes verbs.

By stating that the remnants of Gapping are X^2 -constituents, Sag excludes sentences such as (Sag 1976, 275-6):

(35) *Did Betsy eat the peaches or did Harry
~~eat~~ the grapes?

*Heeft Betsy perziken gegeten of heeft Harrie
 druiven ~~gegeten~~?

(36) *Betsy said that Alan went to the ballgame and
 that Betsy ~~went~~ to the movies.

*Betsy zei dat Alan naar de voetbalwedstrijd ging
 en dat Mary naar de film ~~ging~~.

In general, only major phrases may function as Gapping remnants. Observe however, that the X^2 -restriction on Gapping runs into trouble with sentences such as (37):

(37) a. Bill saw Harry, not Harry ~~saw~~ Bill.

(Lasnik 1972, 90)

Bill zag Harrie, maar Harrie ~~zag~~ Bill niet.

(Bill saw Harry, but Harry ~~saw~~ Bill not)

b. Bill komt wel, en Harrie ~~komt~~ niet.

(Bill comes definitely, and Harry ~~comes~~ not;

Bill does come, and Harry does not come.)

Not, niet and wel (the reverse of not, usually represented in English by a form of "to do") cannot be X^2 -constituents. They form a special class, apart from the projections of X. Therefore, the X^2 -restriction on Gapping cannot be maintained. Sag's observation that X' -constituents cannot be remnants of Gapping holds. The emerging generalization, however, does not seem to be that only X^2 -constituents can function as remnants for Gapping, but rather that nonmaximalized constituents may never function as remnant. This should follow from principles of Universal Grammar, and therefore needs not be stated in the rule of Gapping. We will return to the problem of restricting the shape of the remnants in chapter 3.

2.3. THE GAPS

In several structural descriptions of Gapping recently proposed the number of deletion sites is severely restricted. The rules proposed by Fiengo (1974) and Stillings (1975) contain one gap only, those proposed by Hankamer (1973) and Sag (1976) contain two: an internal one and a rightperipheral one. Most examples with more than one gap obey this pattern, but nevertheless there are examples with leftperipheral and internal gaps (38), or even with three gaps (39). Though the

latter appear far-fetched, the gapping schema itself is probably not the place to express these judgements.

- (38) There has been some flour added to the sauce by Peter and ~~there/has/been~~ some water ~~added~~ ~~to/the/sauce~~ by John.

Er is meel bij de saus gedaan door Piet en ~~er/is~~ water ~~bij/de/saus/geedaan~~ door Jan.

(There is flour to the sauce added by Piet and ~~there/is~~ water ~~to/the/sauce/added~~ by Jan.)

- (39) ? There has been some flour added to the sauce by me and ~~there/has/been~~ some water ~~added~~ to the soup ~~by/me~~.

Er is door Peter meel bij de saus gedaan en ~~er/is~~ door Jan ~~meer~~ bij de soep ~~geedaan~~.

(There is by Peter flour to the sauce added and ~~there/is~~ by Jan ~~flour~~ to the soup ~~added~~.)

In Dutch, the distribution of adverbial phrases is comparatively unrestricted, and consequently examples with more than one internal gap are readily available:

- (40) Marie heeft in de koffiepauze een afspraak gemaakt met haar vriendinnen en Karel ~~heeft~~ in de lunchpauze ~~een/afpraak/geen~~ met zijn vrienden.

(Marie has during the coffeebreak a date made with her girlfriends and Karel ~~has~~ during lunchtime ~~a/date/made~~ with his friends.)

In principle, an infinite number of gaps is possible. This number is presumably restricted only by the fixed capacity of human working memory, and stylistic traditions. It suggests that one should not aim to specify the number or the place of the gaps in the rule of Gapping itself.

2.4. CONSEQUENCES FOR THE FORMULATION OF GAPPING

A rule of Gapping which covers all examples hitherto discussed will have a simple structural description, such as the one proposed in chapter 1 (under (84), repeated here for convenience):

(41) Gapping

W_1	A	W_2	B	W_3		\Rightarrow	\emptyset	2	\emptyset	4	\emptyset
1	2	3	4	5							

This formulation makes no specific claims about the domain, the remnants, or the gaps of the rule, except for a distinction between "true" variables (W) and "constituent" variables (A and B). The rule is restricted with respect to the number of remnants (no more than two) and the number of gaps (no more than three). A formula which drops this specification as well would be:

(42) Gapping (final version)

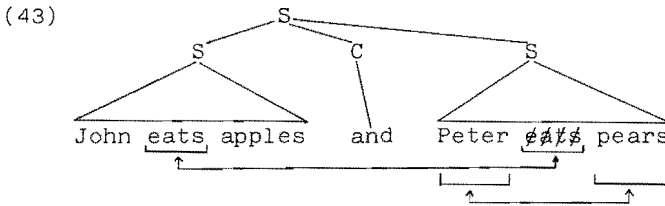
"Delete"

The rule is similar to Chomsky's "Move α " for movement rules (Chomsky 1978, 4). For Gapping as in (42) the difference between true variables and constituent variables should follow axiomatically, in the same way as the axiom for movement rules predicts that only constituents can be moved.

Of course, one half of the all-and-only problem is solved by formulating Gapping as "Delete": trivially all grammatical gapped sentences can be generated. On the other hand, the proposed rule does not generate grammatical gappings exclusively: trivially, it generates all ungrammatical gappings as well. Consequently it requires independently motivated constraints on variables, remnants and domain. It is from this perspective that the somewhat impecunious Gapping formula in (42) derives its significance. From a learnability point of view the rule is quite attractive: the

child only needs to learn whether or not the language displays (42). Therefore, in the present context it holds as a point of method that (42) should not be cluttered up with rule-specific conditions or notational devices. Straightforward counterexamples such as those assembled by Hankamer under the No-Ambiguity Condition, by Sag under the Left Peripheral Deletion, and by Langendoen under the Non Left-peripheral NP Condition, have in fact only little systematic relevance, and, for that reason, should leave one unwilling to give up the unadorned version of (42).

Even then, some comments are in order on the choice of formulating Gapping as "Delete", and not as "Interpret", or "Coindex". The choice relates to our modular approach of Gapping. Gapping is claimed to be governed by two rules: one relating the antecedent string and the gapped string, and the other restricting the extent of the gap. The difference between these two rules is displayed by the arrows in (43).



As argued above (chapter 1, section 2.1.7.) the rule relating the gapped and the antecedent string cannot be considered part of sentence grammar. More will be said about this relation in section 3 of this chapter. In contrast, the rule relating the remnants, and thus specifying the extent of the gap, is a rule of sentence grammar. This part of Gapping is formalized as (42), and its properties will be discussed in chapter 3, where this rule and movement rules will be shown to be constrained alike. It is obvious from (43) that formulating this part of Gapping as "Coindex" or "Interpret" makes no sense insofar as it shows no resemblance to the rules commonly referred to as rules of coindexing or inter-

pretation.

One may further speculate about whether (42) actually deletes terminal elements, or whether it just gives "approval stamps" to strings of constituents which received no lexical content (by an optional rule of lexical insertion). It seems to me that this distinction cannot be shown to be meaningful at present.

3. RECOVERABILITY

Lees (1960, 75) observes that phonological identity of two strings is an insufficient condition for recoverability: the underscored constituents in (44) do not count as identical, as (45) shows.

(44) Drowning cats are hard to rescue.

Drowning cats is against the law.

(45) *Drowning cats, which is against the law, are hard to rescue.

He concludes that "it is necessary to specify that the two constituents in question have the same phrase structure."

Ross and Lakoff (Lakoff 1968, 54) showed that identity of phrase structure is an insufficient condition for recoverability. They present arguments that information from both deep and derived structure is relevant. The argument that the level of deep structure is involved in recoverability runs as follows. Consider (46):

(46) The chickens are ready to eat.

This sentence is two-way ambiguous, since it means either that the chickens are going to eat or that the chickens are going to be eaten. Similarly, in (47), the conjuncts each are two-way ambiguous, resulting in a four-way ambiguous coordination.

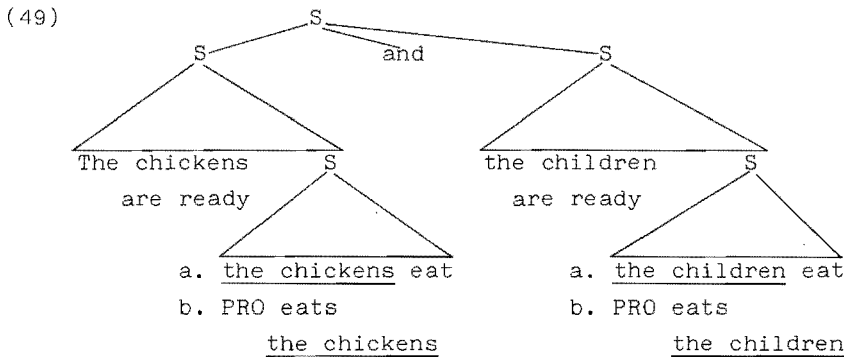
- (47) The chickens are ready to eat and the children
are ready to eat.

Application of VP-deletion in the structure underlying (47), however, reduces the number of available interpretations to two as in (48).

- (48) The chickens are ready to eat and the children
are \emptyset , too.

This means either that both the chickens and the children are going to eat or that both are going to be eaten. The deep structure position of chickens and children thus determines whether or not the VPs involved are identical, i.e. recoverable.

On the other hand, it is clear that the VPs in (48) are not identical at the level of deep structure: one contains as a subject or object children, and the other contains as a subject or object chickens, cf.



This dissimilarity does not disappear earlier than in derived structure. Within the standard theory of Chomsky (1965), Lakoff could do no more than claim that "items that do not appear in the derived structure are completely irrelevant to the question of linguistically significant identity." (Lakoff 1968, 65).

After the introduction of trace theory (Chomsky 1973, Fiengo 1974, and Chomsky 1976), it became clear that the core of the problem had been the standard theory's inability to offer a representation in which deep and surface information are united in a natural way. The introduction of traces clears the way for four different shallow structures of (47). At this level, the conjuncts of (47) receive two structures each:

(50) First conjunct of (47):

- a. The chickens_i are ready (e)_{NP_i} to eat.
- b. The chickens_i are ready (e)_{NP} to eat (e)_{NP_i}.

Second conjunct of (47):

- a. The children_j are ready (e)_{NP_j} to eat.
- b. The children_j are ready (e)_{NP} to eat (e)_{NP_j}.

Disregarding temporarily the different indices of the NPs involved, these structures allow for a straightforward statement of recoverability: the representations of the VPs in (50a) (ready (e)_{NP} to eat) and (50b) (ready (e)_{NP} to eat (e)_{NP}) are not identical, and therefore the interpretation of (48) in which the children are going to eat and the chickens are going to be eaten (or vice versa) does not exist. The level of shallow structure thus seems to be rich enough to explain the recoverability of VP-deletion as regards the structure underlying (47).

Sag (1976, 121) shows that a more sophisticated level than the level of shallow structure is necessary in order to establish linguistically significant redundancy. Sag's argument is based on an intriguing variant of the "ready to eat" examples.

- (51) The chickens are ready to eat, and the children are ready to \emptyset , also.

ical otherwise, are said to be alphabetic variants, if all variables in A are bound in A in precisely the same way as all variables in B are bound in B. Sag's hypothesis then is that deletion is recoverable if the string deleted is an expression at the level of Logical Form and an alphabetic variant of another expression at this level.

In the logical form (54), the following pattern of alphabetic variance obtains ("=" means "is an alphabetic variant of"):

- (54') a. $(x \text{ loves Peter}) \neq (y \text{ loves Peter})$
b. $\lambda x (x \text{ loves Peter}) = \lambda y (y \text{ loves Peter})$
c. $\text{Betsy}, \lambda x (x \text{ loves Peter}) \neq \text{Susan}, \lambda y (y \text{ loves Peter})$

In (a), the variables x and y are in corresponding positions, but they differ, and they are not bound within the expressions. In (b), x and y again differ, but this time they are bound within the expressions by the lambda-operator. The expressions in (b) therefore are alphabetic variants. In (c), Betsy differs from Susan, which renders the expressions invariant in the first place. In brief, two expressions are alphabetic variants if they differ only with respect to variables, and these variables are bound in the same way within the expressions.

This procedure allows Sag to explain the mysterious "ready to eat" examples as follows. One interpretation of the ambiguous (47) (repeated here as (55)), is represented at the level of Logical Form as (55'):

- (55) The chickens are ready to eat and the children are ready to eat.
(55') The chickens, $\lambda x (x \text{ ready } (x, \lambda y (y \text{ eat})))$ &
the children, $\lambda w (w \text{ ready } (w, \lambda z (z \text{ eat})))$

According to these logical forms, $\lambda y (...)$ and $\lambda z (...)$ are alphabetic variants, as are $\lambda x (...)$ and $\lambda w (...)$. Thus, both

small and large VP-deletion is recoverable, resulting in (51) and (48), respectively.

In the second interpretation, (55) is represented as (55") at the level of Logical Form (empty subjects are represented as dummies).

(55") The chickens, λx (x ready (Δ , λy (y eat x))) &
the children, λw (w ready (Δ , λz (z eat w)))

In this logical form, λx (...) and λw (...) are alphabetic variants, but λz (...) is not an alphabetic variant of λy (...), since x and w are bound outside these expressions. Large VP-deletion is recoverable, while small VP-deletion is not. This explains why (51) cannot receive the interpretation that the chickens and the children are going to be eaten, and thus the unambiguity of (51) vs. the ambiguity of (48).

This is the first (and very strong) argument Sag presents in support of his hypothesis that recoverability of deletion is not to be defined at the level of shallow structure. Further arguments involve quantifier and focus phenomena, which interact with deletion. This can be observed not only in VP-deletion, but in Gapping and Question-Answer pairs as well. We will illustrate Sag's analysis of this phenomenon with Gapping and Question-Answer pairs, since the deletion patterns can be reproduced in Dutch.

Consider in this respect the following discourses (Sag 1976, 285).

(56) Q: Who does Betsy love?

a. A: Betsy loves Péter.

b. A: *Bétsy loves Peter.

Q: Van wie houdt Betsy?

(Of whom loves Betsy?)

a. A: Betsy houdt van Péter.

b. A: *Bétsy houdt van Peter.

(Betsy loves of Peter.)

The ungrammaticality of (56b) shows that the stress pattern of an answer is dictated by the question asked. Let us assume that stressed or focussed elements are represented at the level of Logical Form as in (57) (cf. Chomsky 1976, 33):²

- (57) Q: Who-x $\{x_a\} \subset \hat{a}$ (Betsy, λy (y loves a))
 a. A: $\{\text{Peter}_o\} \subset \hat{o}$ (Betsy, λz (z loves o))
 b. A: $\{\text{Betsy}_i\} \subset \hat{i}$ (i, λw (w loves Peter))

The logical form of the question in (57) represents the fact that who is one of the set of people loved by Betsy. The logical form of the answer (57a) represents the fact that Peter is one of the set of people loved by Betsy. (57b) reflects the meaning that Betsy is one of the people who love Peter. By the assumption that well-formed Question-Answer pairs share alphabetic variants at the level of Logical Form, the ill-formedness of (56b) as an answer to (56) is predicted: the expressions $\hat{i}(\dots)$, and $\hat{a}(\dots)$ in (57) are not alphabetic variants. (56a) on the other hand is a well-formed answer, since $\hat{o}(\dots)$ and $\hat{a}(\dots)$ are alphabetic variants. Furthermore, Sag's hypothesis regarding recoverability of deletion predicts that $\hat{o}(\dots)$ is redundant hereby. The answer in (56a) thus may take an elliptical form, cf:

- (56') Q: Who does Betsy love?
 A: Péter.
 Q: Van wie houdt Betsy?
 (Of whom loves Betsy?)
 A: Van Peter.
 (Of Peter.)

For multiple WH-questions, multiple abstraction is allowed (Sag 1976, 286), connecting the logical forms in (59) to the Question-Answer pairs in (58).

(58) Q: Who gave the book to whom?

A: Bétsy gave the book to Péter.

Q: Wie gaf het boek aan wie?

A: Bétsy gaf het boek aan Péter.

(59) Q: Who-x, who-y, $\{x_a, y_u\} \subset \hat{a} \hat{u} (a, \lambda z (z \text{ gave } \underline{\text{the book to u}}))$

A: $\{Betsy_i, Peter_o\} \subset \hat{i} \hat{o} (i, \lambda w (w \text{ gave the book } \underline{\text{to o}}))$

(58) is well-formed, since the corresponding logical forms (the underscored expressions in (59)) are alphabetic variants.

Sag uses this type of set-abstraction for the representation of the particular accent patterns not only in Question-Answer pairs, but in gapped sentences as well. This move is substantiated by the fact that the well-formedness of gapped sentences depends on accent as much as the well-formedness of Question-Answer pairs does. Consider:

(60) Jóhn kissed Súsan in the kitchen and Péter

~~Kísséss Máry íñ/éñé/Kísséñéñ.~~

Jóhn kuste Susán in de keuken en Péter

~~Kússéss Maríe íñ/dé/Késséñéñ.~~

(61) *Jóhn kissed Susan in the kitchen and

~~Jóññ/Kísséss Máry in the díning room.~~

*Ján kuste Susan in de kéuken en

~~Jáñ/Kússéss Maríe in de éétkamer.~~

At the level of Logical Form, (60) and (61) are represented as follows:

(60') $\{John_a, Susan_u\} \subset \hat{a} \hat{u} (a, \lambda x (x \text{ kiss } u \text{ in the } \underline{\text{kitchen}})) \ \& \ \{Peter_i, Mary_o\} \subset \hat{i} \hat{o} (i, \lambda y \underline{\text{(y kiss o in the kitchen}}))$

(61') $\{John_a, kitchen_u\} \subset \hat{a} \hat{u} (a, \lambda x (x \text{ kiss Susan in } u))$
 & $\{Mary_i, dining\ room_o\} \subset \hat{i} \hat{o} (John, \lambda y (y \text{ kiss}$
 $i \text{ in } o$))

The underscored expressions in (60') are alphabetic variants, but the underscored expressions in (61') are not. Therefore, (60) is well-formed, but (61) is not.

As Sag points out, the logical forms just presented provide entities the (un)identity (and thus the (ir)recoverability) of which can be established through the notion of alphabetic variance. Given the lambda-notation and set-abstraction, it is possible to define the recoverability of VP deletion, deletion in Question-Answer pairs, and Gapping by the same means (the notion of alphabetic variance) and at the same level (the level of Logical Form).

As regards the analysis of Gapping, the above suggests the following conclusions. Set-abstraction of constituents which can be questioned or answered suggests that these constituents are also possible remnants of Gapping, since the remnants of Gapping are set-abstracted as well. Interestingly, the verb, which is not a possible remnant of Gapping, does not undergo WH-movement, and cannot be a possible answer:

(62) *Jóhn kissed Betsy and Péter hit ~~Betsy~~.

*Ján zóénde Betsy en Péter slóég ~~Betsy~~.

(63) Q: What did John do?

A: *Kissed.

Q: Wat deed Jan?

A: *Zóénde.

Given set-abstraction for both rules, it must be that the explanation of the ungrammaticality of (62) and (63) is the same: verbs do not set-abstract, and there is thus no apt logical form for the gapped sentences (62) and the Question-Answer pairs in (63).

Furthermore, there are, according to Sag, two positions where quantifiers are represented at the level of Logical Form: the beginning of S and the beginning of VP. For instance, the two meanings of "Someone hit everyone" (paraphrasable either as "there is one person who hit everyone", or "for all people there is someone, not necessarily the same person, who hit him") are represented as (Sag 1976, 107):

- (64) a. $\text{Ex } (x, \lambda y \text{ (Az } (y \text{ hit } z)))$
 b. $\text{Az } (\text{Ex } (x, \lambda y \text{ (y hit } z)))$

If we assume that these positions are available for set-abstraction as well, it follows that the domains at which the recoverability of Gapping can be verified are S', S and VP, and no other, the underscored expressions in (65), (66) and (67) being alphabetic variants.

- (65) S':
 $\text{Who-}x \{x_a, \text{apples}_u\} \subset \hat{a} \hat{u} (a, \lambda w (w \text{ ate } u)) \text{ \& }$
 $\text{who-}y \{y_i, \text{pears}_o\} \subset \hat{i} \hat{o} (i, \lambda z (z \text{ ate } o))$
- (66) S:
 $\{\text{John}_a, \text{apples}_u\} \subset \hat{a} \hat{u} (a, \lambda x (x \text{ ate } u)) \text{ \& }$
 $\{\text{Peter}_i, \text{pears}_o\} \subset \hat{i} \hat{o} (i, \lambda y (y \text{ ate } o))$
- (67) VP:
 $\text{John, } \lambda x (\{ \text{apple}_a, \text{Mary}_u \} \subset \hat{a} \hat{u} (x \text{ gave } a \text{ to } u))$
 $\text{\& } (\{ \text{pear}_i, \text{Sue}_o \} \subset \hat{i} \hat{o} (x \text{ gave } i \text{ to } o))$

In fact, this prediction is borne out by the gapped sentences below.

- (65') S':
 Who ate apples and who ~~ate~~ pears?
 Wie at appels en wie ~~ate~~ peren?
- (66') S:
 John ate apples and Peter ~~ate~~ pears.
 Jan at appels en Peter ~~ate~~ peren.

(67') VP:

John gave an apple to Mary and ~~gave~~ a pear to Sue.

Jan gaf een appel aan Marie en ~~gaf~~ een peer aan Susan.

Both the observation that Gapping always deletes verbs and the fact that it applies in certain domains now follow from the definition of recoverability.

For the formulation of the rule of Gapping this account entails that the domains of the rule need not be specifically provided, and that there is no need to specify that verbs will always belong to the deleted parts. Even more forcefully, assuming Sag's notion of recoverability it would be theoretically undesirable to have the rule of Gapping specify its domain or the verb as a deletee, granted the maxim that a rule only states what the theory cannot explain.

FOOTNOTES TO CHAPTER 2

1. A more difficult case is (i), which is not excluded by the definition of constituent variables:

(i) *John ate at home and Peter ~~ate~~ at noon.

It seems that semantic rather than syntactic disparity is involved here.

2. My representation of questions deviates from Sag's in one minor respect. I assume that WH-constituents are not only represented as quantifiers, but as set-abstracted constituents as well. This produces the somewhat abundant representation of (57). An advantage of this account is, that Question-Answer pairs now can be said to share true alphabetic variants, and not only (as Sag does) alphabetic

variants of open sentences. This explains that it is possible to present an elliptical answer to a question (cf. 56'), and allows the statement that all deletion rules are governed by a recoverability condition in terms of full alphabetic variance.

CHAPTER 3.

Constraints

In this chapter we will investigate a number of constraints on the rule of Gapping as formulated in chapter 2 and repeated here for convenience:

(1) Gapping

Delete

In two separate parts we will be concerned with constraints on (i) the remnants of the rule, and (ii) the deleted parts of the rule.

In part 1 we will discuss a number of constraints on the contents of the remnants recently proposed by Hankamer (1973), Fiengo (1974), Chomsky (1973), Bresnan (1976) and Sag (1976). We will find that Hankamer's Major Constituent Condition is an adequate, and, more importantly, the most restrictive means of constraining the remnants of the rule of Gapping.

In part 2 we will discuss a number of constraints proposed by Ross (1967), Bach and Horn (1976), Chomsky and Lasnik (1977), Chomsky (1978), Koster (1978b) and Zwarts (1978). We will show that, while there exists a clear similarity between the rule of Gapping and WH-movement, these recent constraints fail to bring out this parallelism in a revealing way. A new proposal is put forward in the form of the Strict Subjacency Constraint in order to incorporate the Gapping phenomena in an adequate account of sentence grammar.

1. CONSTRAINING THE REMNANTS

1.1. MAJOR CONSTITUENCY

In Hankamer (1973), the author adds as a condition to the rule of Gapping that the remnants be major constituents:

(2) The Major Constituent Condition

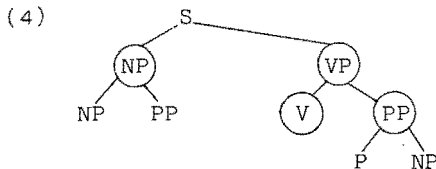
The remnants of Gapping are Major Constituents.

where major constituents are defined as follows:

(3) Major Constituents

A "major constituent" of a given sentence S_0 is a constituent either immediately dominated by S_0 or immediately dominated by VP, which is immediately dominated by S_0 . (Hankamer 1973, 18 fn.2)

To give an example, the circled nodes of (4) are major constituents, and the noncircled nodes are not:



As it should, the notion of "Major Constituent" is claimed by Hankamer to be relevant to other syntactic rules as well. Hankamer (1971, 79), for instance, mentions the rule of Topicalization, by which only major constituents can be preposed. Thus, (5) and (6) are ungrammatical for the same reason: in (5) a nonmajor constituent functions as a remnant for Gapping, while in (6) a nonmajor constituent is preposed by Topicalization:

- (5) *John saw the queen of England and Peter
~~saw/the/queen~~ of Holland.

*John heeft de koningin van Engeland gezien en Peter
~~heeft/de/koningin~~ van Nederland ~~gezien~~.

- (6) *Of Holland Peter saw the queen.

*Van Nederland heeft Peter de koningin gezien.

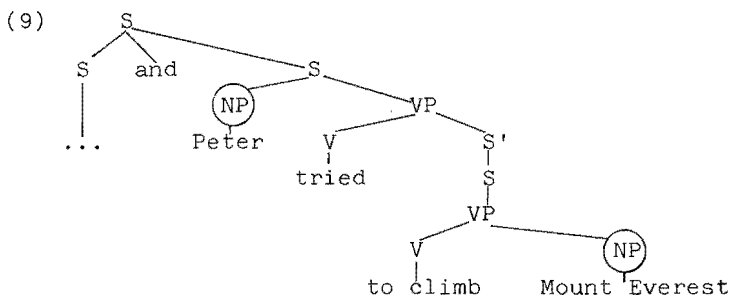
In fact, the Major Constituent Condition is suggested by Hankamer as a constraint on the application of all syntactic rules.

Hankamer (1971 and 1973) does not distinguish between S' and S, but if this distinction is introduced, immediate daughters of S' will be major constituents as well: a preposed WH-constituent forms a successful remnant of Gapping, cf.:

- (7) Who ate apples and who ~~ate~~ pears?
 Wie at appels en wie ~~at~~ peren?

Observe furthermore that the notion "major constituent" is not equivalent to the notion "clausemate": two constituents are clausemates if they belong to the same sentential domain. Thus, in (8), structured as in (9), the remnants of Gapping are major constituents, but not clausemates:

- (8) John tried to climb Mont Blanc, and Peter
~~tried/to/climb~~ Mount Everest.



The Gapping-cum-Major Constituent Condition-analysis must be augmented with a rule of N- and Adj-Deletion. Without such a rule the sentences in (10) would be counterexamples to the Major Constituent Condition (2). (N-Deletion after a genitive NP is impossible in Dutch, cf. the ungrammaticality of (10a).)

- (10) a. John took Bill's clothes and Harry
~~took~~ John's ~~clothes~~.
 *John nam Bills kleren en Harry
~~nam~~ Johns ~~kleren~~.
- b. John bought three books and Peter
~~bought~~ four ~~books~~.
 John kocht drie boeken en Peter
~~kocht~~ vier ~~boeken~~.
- c. The first house is 50 feet deep and the second
 house ~~is~~ 60 feet ~~deep~~.
 Het ene huis is 5 meter diep en het andere huis
~~is~~ 6 meter ~~diep~~.

The sentences in (11) show that this rule is independently motivated: even in the absence of a linguistic antecedent adjective and noun delete in such sentences:

- (11) a. Harry took John's ~~clothes~~.
 *Harry nam Johns ~~kleren~~.
- b. Peter bought four ~~books~~.
 Peter kocht er vier ~~boeken~~.
- c. The second house is 60 feet ~~deep~~.
 Het andere huis is 6 meter ~~diep~~.

Under this assumption, we are able to maintain that the application of the rule of Gapping is restricted by the Major Constituent Condition.

Several conditions other than major constituency have been proposed as constraints on the remnants of Gapping. We will now review these, and compare the empirical predictions with the predictions made by the Major Constituent Condition.¹

1.2. FIENGO'S HEAD CONDITION REFORMULATED AS A MAXIMIZATION PRINCIPLE

Though presented as a restriction on the gap, the Head Condition of Fiengo (1974, 115) at the same time influences the shape of the remnants, and does so in an interesting way. For this reason, it is useful to review this condition here rather than in the second part of this chapter.

The concept "head" is defined as follows: only one daughter of a constituent M is the head (+m), all other daughters are nonheads (-m). Which daughter will be the head follows from X-bar theory: V is +m of VP, N is +m of NP, P is +m of PP, S is +m of S', etc. Fiengo claims that S is a headless category: all daughters of S will be M.

Fiengo formulates the Head Condition as a condition on the interpretation of syntactic structure. Disregarding the question of whether Gapping is a rule of deletion or a rule of interpretation, let us refer with the notion 'gap' to either the deletee or the interpretee.

(12) Head Condition

If the gap contains -m of M, it contains +m of M.

By the Head Condition, the distribution of (13) versus (14) below (cf. Fiengo 1974, 113, 114) is accounted for. As shown in (13), +m constituents may be gapped ohne weiteres, and -m constituents may be gapped if their heads are gapped as well. (14) is ruled out, since a -m constituent (the object of VP) cannot delete if its head (V) does not.

- (13) a. Philosophers loathe bibliomancy and
mystics loathe reading.

Filosofen haten bibliofoben en mystici
haten bibliofielen.

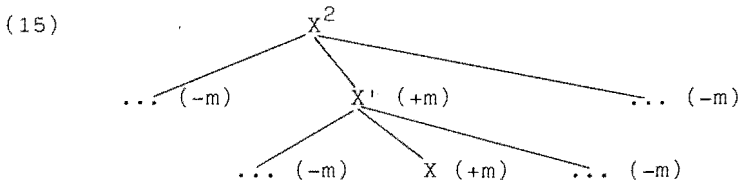
- b. He sold the Amati to Sherlock yesterday and
he sold the Amati to Mycroft the day before.

Hij verkocht de Sunbeam gisteren aan Kees en
hij verkocht de Sunbeam vandaag aan Freddie.

- (14) *Philosophers loathe bibliomancy and
mystics prefer bibliomancy.

*Filosofen haten bibliofoben en
mystici prefereren bibliofoben.

As shown in (12), Fiengo formulates the Head Condition as a condition on the gap, but it could have been equally well formulated as a condition on the remnants: if a remnant contains $+m$ of M , it contains $-m$ of M . This implies that the head of M may not function as a remnant unless all nonheads are remnants as well. Given X-bar theory, this condition prohibits Gapping from producing nonmaximal projections of a category cf. (15):

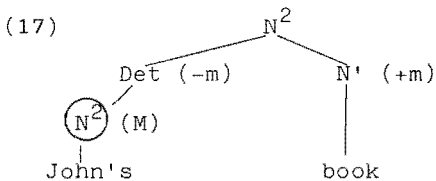


X in (15) can function as a remnant only if the accompanying $-m$ constituents are remnants as well, that is, if X' is a remnant. X' in turn cannot function as a remnant unless the accompanying $-m$ daughters of X^2 are remnants as well. It follows that the only possible remnant in (15) is X^2 . Observe that in this respect the Head Condition is similar to (16), which looks like a version of the A over A Principle:

(16) Maximization Principle

A transformation may not apply to X^n if X^n is immediately dominated by X^m , and $m \not\geq n$.

The Maximization Principle differs from Chomsky's A-over-A Principle (Chomsky 1973, 235) in two essential respects. First, old-fashioned A-over-A is not restricted to immediately dominating nodes, and thus may prohibit the selection of e.g. the circled N^2 in structure (17).



The intervening determiner node renders both the Head Condition and the Maximization Principle (16) inapplicable. The former does not apply, because the determiner, not being a projection of a lexical category, cannot dominate heads and nonheads. The latter does not apply, because the determiner node intervenes. Therefore, the upper N^2 does not immediately dominate the circled N^2 . Second, the A-over-A principle does not disregard the number of bars, and therefore never prohibits the selection of a node dominated by another node of the same projection type with more bars.

It can be shown that the Major Constituent Condition and the Head Condition c.q. Maximization Principle make different claims in at least some cases. The examples in (18), for instance, are excluded by the Major Constituent Condition, but not by the Head Condition, since a +m part of a major constituent is contained in the gap.

(18) a. *Peter was invited by Mary, and Joan

was invited by John.

*Peter werd uitgenodigd door Mary, en Joan

werd uitgenodigd door John.

- b. *John bought a little bit more or a lot ~~more~~.
 *Jan kocht een beetje meer of een heleboel ~~meer~~.

This implies that the Major Constituent Condition should be preferred unless independently motivated constraints are brought up to exclude (18).

1.3. VARIATIONS ON A-OVER-A

The A-over-A Principle, defined in Chomsky (1973, 235) as

- (19) If a transformation applies to a structure of the form

$$|\alpha \cdots |_{A} \cdots | \cdots |$$

where α is a cyclic node, then it must be so interpreted as to apply to the maximal phrase of the type A.

can be used as a condition which forces the same results as the Major Constituent Condition - at least for some rules in some instances. An example is the rule of WH-movement, applied to the ambiguous (20), which is structured either as (21a) or (21b) (Chomsky 1964, 44).

- (20) I saw the boy walking toward the railroad station.

- (21) a. I saw $|_{NP}$ $|_{NP}$ the boy $|$ $|_S$ walking toward the railroad station $||$

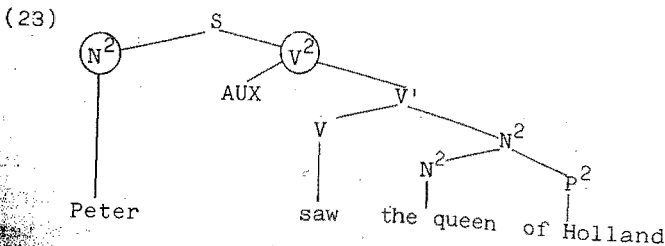
- b. I saw $|_{NP}$ the boy $|$ $|_{ADV}$ $|_S$ walking toward the railroad station $||$

The unambiguity of (22) reveals that WH-movement applies to the boy in (21b), but not in (21a):

(22) Who did I see walking toward the railroad station?

Both the Major Constituent Condition and the A-over-A Principle are able to account for the correct distinctions. The derivation of (22) from (21a) is excluded by the Major Constituent Condition, because $|_{NP} \text{the boy}|$ is not a major constituent. The same derivation is excluded by the A-over-A Principle because $|_{NP} \text{the boy}|$ is dominated by another NP.

Since the structural description of Gapping (1) lacks constant categories, (19) is inapplicable to our formulation of Gapping. In Sag (1976, 278), however, a formulation of Gapping is presented which specifies the shape of the remnants (cf. (29) in chapter 2): these are constituents with two bars (the maximal number of bars in Sag's framework). Such a structural description makes it possible to invoke the A-over-A condition, since only the maximal X^2 constituents may function as remnants. Even then, however, the A-over-A Principle misapplies unless special provisions are made. In order to see this, consider structure (23):

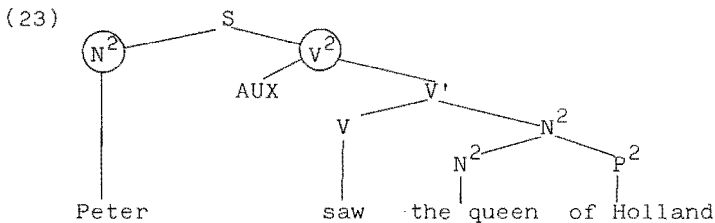


If only maximal X^2 constituents may function as remnants, no deletion will take place in (23), since the maximal X^2 constituents will be circled N^2 and V^2 . Thus, the ungrammatical (5) (here repeated as (24)) is excluded, but at the same time the only possible Gapping outcome (25) will also be excluded as well.

(22) Who did I see walking toward the railroad station?

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If only maximal X^2 constituents may function as remnants, no deletion will take place in (23), since the maximal X^2 constituents will be circled N^2 and V^2 . Thus, the ungrammatical (5) (here repeated as (24)) is excluded, but at the same time the only possible Gapping outcome (25) will unfortunately be excluded as well.

(24) *John saw the queen of England and Peter
~~ðəw/ħə/dʌðəŋ~~ of Holland.

*John heeft de koningin van Engeland gezien en Peter
~~ħeħt/ðə/kɒŋɪŋgɪŋ~~ van Nederland ~~geziħ~~.

(25) John saw the queen of England and Peter
~~ðəw~~ the queen of Holland.

Jan heeft de koningin van Engeland gezien en Peter
~~ħeħt~~ de koningin van Nederland ~~geziħ~~.

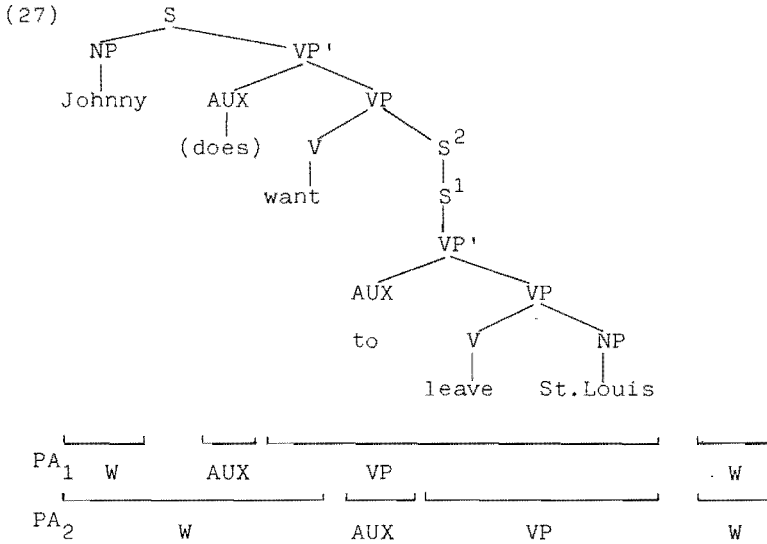
In order to come to grips with this situation, Sag proposes to alter the A-over-A Condition so as to exclude (24) but not (25). The outcome of this, the Immediate Domination Principle, shares the merits of and is narrowly related to Bresnan's Relativized A-over-A Principle (Bresnan 1976, 16). By the latter the choice of context predicates is free (i.e. not constrained by the A-over-A Principle), while target predicates must be maximized, although relative to that context. By definition, unspecified variables are not predicates (cf. Bresnan 1976, 7). Since the targets of Gapping are variables, the Relativized A-over-A principle, being defined on target predicates, is inapplicable.

The Immediate Domination Principle diverges from the Relativized A-over-A Principle in that the distinction between target and context is made irrelevant, and replaced by the notion of "minimal difference" (which in its turn is based on the distinction between variable and constant term):

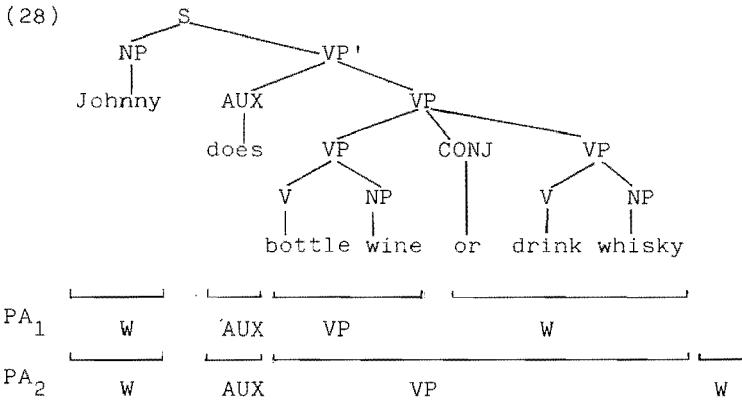
(26) Minimal difference (Sag 1976, 237)

"..., two proper analyses differ minimally if for every predicate in the structural description, except one, the value of the predicate is the same under both proper analyses. Since variables are not predicates, this means that in all cases of two minimally differing proper analyses, a variable term will "cover" a longer substring in one than in the other."

To give an example, according to this definition the proper analyses of VP-deletion in (27) are not minimally different, since the respective values of both AUX and VP differ.



In (28), only the constant term VP is different, and thus PA₁ and PA₂ are minimally different proper analyses.



Formally, the Immediate Domination Principle is stated as follows:

(29) Immediate Domination Principle (Sag 1976, 237)

Given two proper analyses, PA_1 and PA_2 , of a sentence S with respect to a transformation T which differ minimally with respect to the value of some predicate P in the structural description of T , if

- (1) $/P/_{PA_1}$ (the value of P under PA_1) is some terminal substring of t_1 ,
 - and (2) $/P/_{PA_2}$ is some terminal substring t_2 ,
 - and (3) t_1 is²analyzable as A_1 ($A_1 \in V_{NT}$),
 - and (4) t_2 is analyzable as A_2 ($A_2 \in V_{NT}$),
 - and (5) A_1 immediately dominates A_2 ,
- then PA_2 is an inadmissible proper analysis of S with respect to T .

This principle can be paraphrased as follows:

- (29') If two proper analyses, PA_1 and PA_2 , of a sentence S with respect to a transformation T differ minimally with respect to the value of some predicate P in the structural description of T , and predicate P_1 of PA_1 dominates predicate P_2 of PA_2 immediately, then PA_2 is an inadmissible proper analysis of S with respect to T .

It follows from (29), that in Sag's view maximization is relevant to predicates only. Since variables are not predicates, it follows that for Gapping only the remnants (X^2) are subject to (29).

The Immediate Domination Principle is distinct from the A-over-A Condition in two respects: given two predicates the A-over-A Condition selects the dominating predicate, while (29) selects the topmost only if both predicates (i) immediately dominate each other, and (ii) are adjacent to one variable at least (otherwise a minimal difference is lacking).

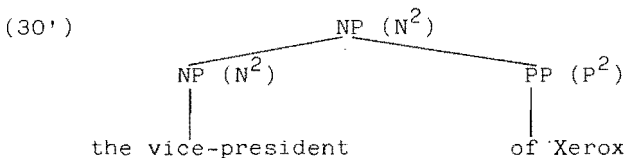
This implies that in (27) both proper analyses are allowed, since they do not differ minimally. In (28), however, the proper analyses differ minimally, and furthermore, the circled VPs dominate each other immediately. Thus, only proper analysis 2 is allowed. This corresponds precisely to the possible outputs of VP-deletion in structures such as (27) and (28), cf.:

- (27') a. Peter does not want to leave St. Louis, but Johnny does.
 b. Peter does not want to leave St. Louis, but Johnny does want to.
- (28') a. *Peter does not bottle wine and drink beer, but Johnny does (\emptyset), and drink whisky.
 b. Peter does not bottle wine and drink beer, but Johnny does.

In the structural description of Gapping, the predicates (the X^2 remnants) alternate with variables, and thus most proper analyses differ minimally. This implies that a X^2 constituent cannot function as a remnant if it is immediately dominated by another X^2 constituent. Sag illustrates this point with (30).

- (30) a. *John met the vice-president of IBM, and Betsy ~~met the vice-president of Xerox.~~
 b. *John ontmoette de president van IBM en Betsy ~~ontmoette de president van Xerox.~~

He claims that the PP of Xerox is immediately dominated by NP, cf. (30').

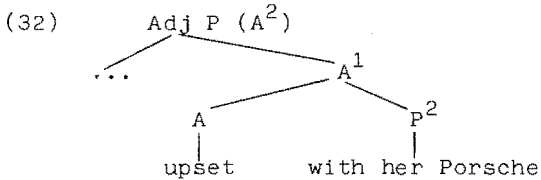


In this case the Immediate Domination Principle excludes of Xerox as a remnant of Gapping.

1.4. SAG VERSUS HANKAMER

Sag makes no effort to show that the Immediate Domination Principle beats the Major Constituent Condition. He presents only one example in which both constraints make different empirical claims. The example is (31) which contains an adjective phrase for which Sag claims the structure sketched in (32) (Sag 1976, 271):

- (31) a. Carol was happy with her Oldsmobile, and Margie
~~was~~ upset with her Porsche.
b. Carol was upset with her Oldsmobile, and Margie
~~was/upset~~ with her Porsche.

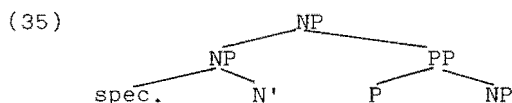
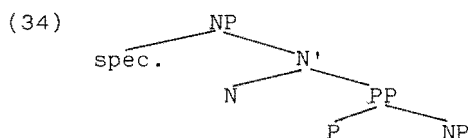


According to the Immediate Domination Principle, both A^2 and P^2 are correct remnants, since they do not immediately dominate one another. For Hankamer's Major Constituent Condition sentence (31b) is a problem, if the structure of adjective phrases is (32). With her Porsche is not a major constituent (it is not immediately dominated by S or VP), and thus the Major Constituent Condition incorrectly predicts that (31b) will be ungrammatical. Obviously, this problem can be circumvented by assuming that P^2 in (32) is not dominated by AP, but by VP. There may be arguments favoring this structure. (33) for instance, would be excluded quite naturally, since there is no VP in prenominal position.

- (33) *These happy with their oldsmobiles girls.

This shows that (31) as a point in favor of the Immediate Domination Principle is unconvincing. Sag does not present further examples indicative of empirical differences between the Major Constituent Condition and the Immediate Domination Principle, and it appears that relevant examples are hard to come by.

A case in point may be found in internal NP-structure. It has been argued by Zwarts (1976) that NP-internal PPs either take the position in (34) or that in (35).



Corresponding examples are:

(34') a son of this woman
 een zoon van deze vrouw

(35') a boy with red hair
 een jongen met rood haar

The structural difference between (34) and (35) can be motivated in several ways. First, in examples with both kinds of PPs the PP of (34) precedes the PP of (35) (cf. 36), while the reverse is impossible (cf. 37):

(36) a son of this woman with red hair
 een zoon van deze vrouw met rood haar

(37) *a son with red hair of this woman
 *een zoon met rood haar van deze vrouw

A second argument for the distinction is based on reflexives, and due to Blom (1977, 394). Consider (38) vs. (39) (antecedent and anaphor underscored):

(38) Their letters to each other were eligible for publication.

Hun brieven aan elkaar waren voor publikatie bestemd.

(39) *Their undertaking with each other became a succes.

*Hun onderneming met elkaar werd een groot succes.

This pattern can be explained under the assumption that reflexives can be bound only by a superior antecedent (see Daalder and Blom 1975/1976). In structure (34), though not in structure (35), the specifier is superior to the NP dominated by PP. The grammaticality differences in (38) and (39) thus can be explained if (34) is the structure of (38); and (35) is the structure of (39).

Argument three in favor of the distinction between (34) and (35) is based on anaphoric relations as well. Vergnaud (1974, 34) observes that the following condition holds:

(40) Disjunction Condition

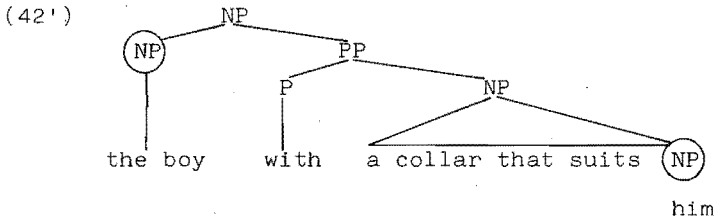
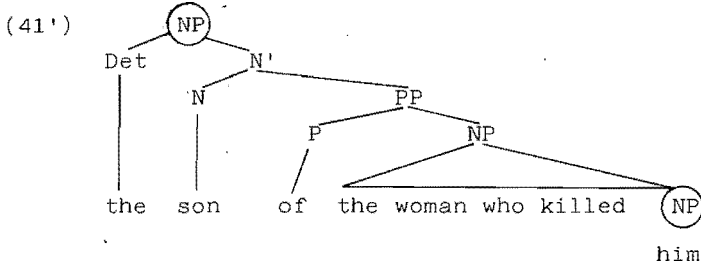
If, in a string, two noun phrases NP_1 and NP_2 are anaphorically related, then the string must be analyzable as $\dots NP_1 \dots NP_2 \dots$ or as $\dots NP_2 \dots NP_1 \dots$.

This condition (which, incidentally, is redundant if rules of anaphora refer to both NPs, since the terms of a structural description are always disjoint) may be used as a test for distinguishing between (34) and (35). Consider (41) and (42) (anaphor and antecedent underscored) and their corresponding structures:

(41) *The son of the woman who killed him was a Nazi.

*De zoon van de vrouw die hem doodde was een Nazi.

- (42) The boy with a collar that suits him is a designer.
De jongen met de trui die hem goed staat is een ontwerper.



The difference between (41) and (42) can be explained by the Disjunction Condition given the structural difference of the NP-internal PPs. In (42') the two circled NPs are disjoint, while in (41') they are not.

Finally, the outline of a fourth argument I owe to David Lightfoot. It only holds for English, where it has been argued that one is the pronominalized form of N' (cf. Jackendoff 1977, 58). In the examples under consideration one-pronominalization provides the following difference:

- (43) a. *I met the son of this woman and
 you met the one of that woman.
 b. I met the boy with red hair and
 you met the one with blue hair.

These examples indicate that boy in (35') is exhaustively dominated by N', but son in (34') is not.

These four arguments motivate the different structures (34) and (35). For the Immediate Domination Principle these structures imply that the PP-node in (34), which is not immediately dominated by another X^2 constituent, is a correct Gapping remnant, while the PP-node in (35), which is immediately dominated by NP, is not. This prediction, however, is false: both (44), which corresponds to (34), and (45), which corresponds to (35), are ungrammatical:

- (44) *Peter met the son of my niece and Max
~~who~~/~~the~~/~~son~~ of my neighbor.
 *Peter ontmoette de zoon van mijn nicht en Max
~~who~~/~~the~~/~~son~~ van mijn buurman.
- (45) *Peter met a boy with red hair and John
~~who~~/~~a~~/~~boy~~ with black hair.
 *Peter ontmoette een jongen met rood haar en John
~~who~~/~~a~~/~~boy~~ met zwart haar.

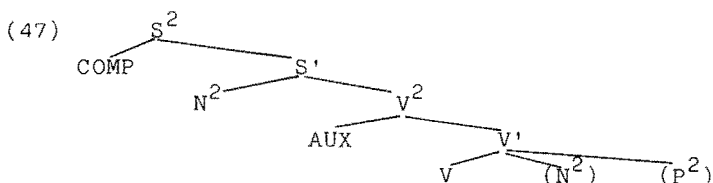
In Hankamer's analysis, on the other hand, these sentences are excluded: neither the PP in structure (34) nor the PP in structure (35) is a major constituent. This implies that the Major Constituent Condition fits the facts more adequately than the Immediate Domination Principle.

Even apart from the objection that the Immediate Domination Principle cannot be shown to surpass the Major Constituent Condition in empirical adequacy, there are further problems related to it. Observe that the Immediate Domination Principle is crucially based on the assumption that the structural description of Gapping specifies the remnants as X^2 constituents. Not all remnants, however, are X^2 constituents, as shown above (chapter 2, section 2.2.) with examples such as :

- (46) Bill saw Harry, not Harry ~~saw~~ Bill.
 Bill zag Harrie, maar Harrie ~~zag~~ Bill niet.

In (46) not (niet) is a grammatical remnant, but not a X^2 constituent.

Another defect relates to the sentential structure of English, which according to Sag has roughly the shape of (47).



The Immediate Domination Principle predicts that X^2 daughters of S' and V' are possible Gapping remnants, while X^2 daughters of S^2 and V^2 are not. This is a surprising result and it is hard to think of a reason why this should be true. More seriously, it appears to be in conflict with the facts. By-phrases, for instance, have been argued to be dominated by V^2 (see Williams, 1974). Still, they may perfectly well serve as remnants of Gapping:

- (48) The first story was told by Peter and
the second story ~~was/told~~ by John.

Het eerste verhaal werd verteld door Peter en
het tweede verhaal ~~werd/verteld~~ door John.

Of course, one could propose to adapt constituent structures to the outcome of Gapping, but that would be a genuine case of putting a cart before the horse.

These observations conclude our discussion of the Immediate Domination Principle. As indicated, this principle cannot be shown to be superior to the Major Constituent Condition. Even worse, it is in conflict with the data, given some well-motivated structures with PP-complements and by-phrases.

1.5. CONCLUSION

A comparison of the Head Condition, several versions of the A-over-A Principle, and the Major Constituent Condition reveals that the latter is to be preferred as a constraint on Gapping. This is not meant to imply that the Major Constituent Condition is the better constraint for other rules of sentence grammar as well. It is obvious that e.g. the preposition stranding phenomena (the key factor in developing the Relativized A-over-A Condition, cf. Bresnan 1976) still motivate the Relativized A-over-A Principle and the Immediate Domination Principle. The conclusion seems to be that both the Major Constituent Condition and some version of the A-over-A Condition are valid constraints on rules of sentence grammar. It remains to be shown whether interesting generalizations as to their domains of applicability will follow from the investigation of further facts.

2. CONSTRAINTS ON THE GAPS

This section will consist of three parts. First I will point out a number of similarities between the rule of Gapping and other rules of sentence grammar. I will deal with constraints on variables as proposed by Ross (1967), Bach and Horn (1976), and Chomsky (1973). Secondly, I will show that recent generalizations over these constraints in Chomsky and Lasnik (1977), Chomsky (1976 and 1978), Koster (1978b) and Zwarts (1978) fail to account fully for the similarity between Gapping and WH-movement. Finally, I will present the Strict Subjacency Condition as a generalization in line with that proposed by Chomsky (1976) in terms of Subjacency.

A cornerstone to the present exposition is the observation that the following two sentences are ungrammatical:

- (49) *John said that Peter was ill and
Peter ~~said/that~~ John ~~was/ill~~.

*John zei dat Peter ziek was en
Peter ~~zei/dat~~ John ~~ziek/was~~.

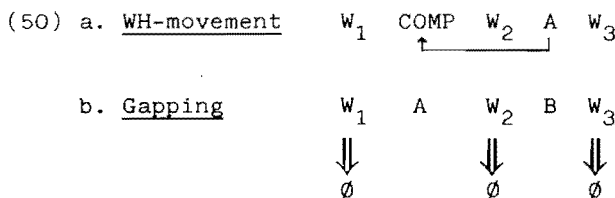
These sentences are excluded neither by the Major Constituent Condition, nor by any of the alternative constraints discussed in the first part of this chapter. It was suggested to me by Riny Huybregts that (49) can be explained by the Tensed S Condition: remnants of Gapping may not be constituents of different tensed sentences.

2.1. OBSERVATIONS

2.1.1. SIMILARITIES BETWEEN MOVEMENT AND DELETION

Gapping can be shown to obey constraints most of which were originally designed as constraints on movement rules. This will be illustrated by a comparison of Gapping and WH-

movement. First consider the structural descriptions of the rules:



Roughly (i.e. disregarding for a second the Tensed S Condition), the observation holds that a string that can be crossed by WH-movement is a string that can be gapped. The structural descriptions make crucial use of the variable: an arbitrarily long string may be deleted by Gapping, and a WH-constituent may move over an arbitrarily long string. This is shown by the following examples:

- (51) a. i. What does John want?
 ii. John wants beer and
 Peter ~~wants~~ wine.
- i. Wat wil Jan?
 ii. Jan wil bier en
 Peter ~~wil~~ wijn.
- b. i. What does John want to try?
 ii. John wants to try this, and
 Peter ~~wants/to/try~~ that.
- i. Wat wil Jan proberen?
 ii. Jan wil dit proberen en
 Peter ~~wil~~ dat ~~proberen~~.
- c. i. What does John want to try to begin?
 ii. John wants to try to begin this, and
 Peter ~~wants/to/try/to/begin~~ that.
- i. Wat wil Jan proberen te beginnen?
 ii. Jan wil dit proberen te beginnen, en
 Peter ~~wil~~ dat ~~proberen/te/beginnen~~.

- d. i. What does John want to try to begin to write?
- ii. John wants to try to begin to write a novel,
and Peter ~~wants to try to begin to write~~
a play.
- i. Wat wil Jan proberen te beginnen te schrijven?
- ii. Jan wil proberen te beginnen een novelle te
schrijven en Peter ~~will proberen te beginnen~~
een toneelstuk ~~te schrijven~~.

Kuno (1976) attributes to an anonymous reader of Linguistic Inquiry the discovery of the pattern in (52) and (53) which illustrates the same point (p.317, main text and footnote):

- (52) a. i. John went out to buy beer, and Bill
~~went out to buy~~ fried chicken.
- ii. This is the fried chicken that Bill went out
to buy.
- b. i. John was glad to see Jane, and Bill
~~was glad to see~~ Martha.
- ii. There were those who Bill was glad to see,
and those who he was not.
- c. i. John began singing a chanson, and Bill
~~began singing~~ a Japanese song.
- ii. The song that Bill began singing was a Japanese
song.
- d. i. John went out singing a chanson, and Bill
~~went out singing~~ a Japanese song.
- ii. The song that Bill went out singing was
a Japanese song.

- (53) a. i. *John came home to find his wife sick, and Bill *ɕəʊd/ʰəʊd/ɛd/ɛɪd* his child *ɕɪɕɪ*.
 ii. *My wife, who I came home to find sick, was in a lousy mood.
- b. i. *John must be a fool to have married Jane, and Bill *ʰʌʃt/ʰɛd/ɔ/ɛd/ɛɪd/ɛd/ʰʌʃt/ɔdɹɪd* Martha.
 ii. *The woman who John was a fool to have married was Jane.
- c. i. *Tom went to Florida to learn to play tennis and Bill *ʰɛnt/ɛd/ɛɪdɹɪdɔ/ɛd/ɛdɹn/ɛd/ɔɪd* squash.
 ii. *What did Tom go to India to become?
- d. i. ??John was upset having received A - for the course, and Bill *ʰʌʃ/ʰɔʃɛt/ʰʌɪɪŋg/ɛdɛɪvɛd B - ɛdɹ/ɛd/ɕɔvɹɛd*.
 ii. ??What grade was John upset having received for the course?

This indicates that the explanations of the difference between (52) and (53) should have a common basis for both rules. To give a last example, the ungrammatical multi-gap examples discussed by Stillings (1975, 270), the (i)-variants of (54), are to be ruled out by constraints which hold for WH-movement as well, as shown by the (ii)-variants:²

- (54) a. i. *Al was clearly intent on telling Alice to buy the lettuce and Alfred *ʰʌʃ/ɕɪdɹɪɪ/ɪntɛnt/ɔn ɛdɪɪɪd* Jim *ɛd/ʰʌɪ/ɛd/ɛɛɛɛɕɛ*.
 ii. *He asked who Alfred was clearly intent on telling to buy the lettuce.
- b. i. *Nancy thought Mike foolish for even talking to Sally and Cindy *ɛdʰʌŋt* Alfonse *ɛdɔɪɪɛn/ɛdɹ ɕvɛn/ɛɪkɪŋg/ɛd/sɪɪɪ*.
 ii. *I'd like to know who Cindy thought foolish for even talking to Sally.

- c. i. *John asked George to be the one to inform Mary of Ellington's death and Fred asked Sam to be the one to inform Mary of Ellington's death.
- ii. *Which friend did he ask to be the one to inform Mary of Ellington's death?
- d. i. *The box certainly contained thumbtacks before Marty spilled them and the carton certainly contained pins before Marty spilled them.
- ii. *They wondered how many pins the carton certainly contained before Marty spilled them.
- e. i. *I plan to talk to Mary a week from next Tuesday and John plans to talk to Fred a week from next Tuesday.
- ii. *To whom does John plan to talk a week from next Tuesday?
- f. i. *Arthur put his boa constrictor under the mattress at 80 W. Warren and Bernie put his plywood under the mattress at 80 W. Warren.
- ii. *He will tell you what Bernie put under the mattress at 80 W. Warren.

In view of these similarities between the rules of WH-movement and Gapping, we will review in the following sections some well-known constraints on WH-movement in order to establish their value for Gapping.

2.1.2. THE (COMPLEX) NP CONSTRAINT

The NP Constraint of Bach and Horn (1976, 280), which includes Ross' Complex NP Constraint, accounts for the fact that a WH-constituent may not move out of true NPs:

(55) The NP Constraint

No constituent that is dominated by NP can be moved or deleted from that NP by a transformational rule.

This constraint overlaps to some extent with

(i) the Complex NP Constraint (Ross 1967, 70); it prohibits movement out of sentences which are headed by a lexically filled NP (cf. (56) and (57));

(ii) the Subject Condition (Chomsky 1973, 250); it prohibits movement out of subjects (cf. (58));

(iii) Subjacency (Chomsky 1973, 247); it prohibits movement out of picture noun phrases (cf. (59) and (60));

(iv) the Left Branch Condition (Ross 1967, 13, 114); it prohibits movement out of a determiner (cf. (61)):

(56) *Which flowers did John believe the claim that Peter saw?

*Welke bloemen weersprak Jan de bewering dat Peter gezien had?

(57) Which flowers did John believe that Peter saw?

Welke bloemen geloofde John dat Peter gezien had?

(58) a. *About whom did stories terrify John?

*Over wie maakten verhalen Jan bang?

b. *About what were books reviewed by Bill?

*Waarover werden boeken becritiseerd door Bill?

(59) a. *Of whom did Charles lose a picture?

*Van wie heeft Charles een foto verloren?

b. *About what did Bill destroy an article?

*Waarover heeft Bill een artikel vernietigd?

(60) a. Of whom did Charles take a picture?

Van wie heeft Charles een foto genomen?

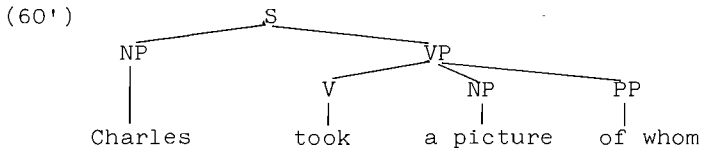
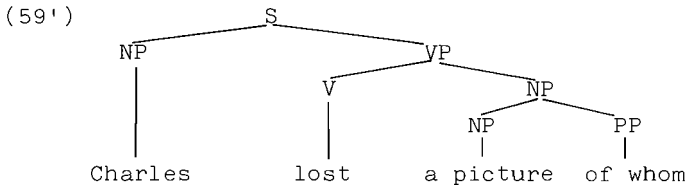
b. About what did Bill write an article?

Waarover heeft Bill een artikel geschreven?

(61) *Whose did you find book?

*Wiens heb je boek gevonden?

Problematic for the NP Constraint is the grammaticality of the examples in (60). Bach and Horn claim that in these sentences the preposed PP is not dominated by NP in deep structure. The difference between (59) and (60) thus would be due to a difference of constituent structure:



In Dutch, this difference in constituent structure can be easily motivated by the examples in (62) and (63), which show that NP and PP in (60) are interchangeable, but NP and PP in (59) are not:

- (62) a. *Charles heeft van Jan een foto verloren.
(Charles has of John a picture lost)
- b. *Bill heeft over sex een artikel vernietigd.
(Bill has about sex an article destroyed)
- (63) a. Charles heeft van Jan een foto genomen.
(Charles has of John a picture taken)
- b. Bill heeft over sex een artikel geschreven.
(Bill has about sex an article written)

It seems that differences in constituent structure may well be the cause of whether or not the PP can be questioned.

The pattern of (56) through (61) can be reproduced in gapped sentences, cf. (64) through (69):

- (64) *John discussed my question of which flowers they saw and Bill *discussed/my/question* (of) which animals *they/saw*.

*Jan besprak mijn vraag welke bloemen ze gezien hadden en Bill *besprak/mijn/vraag* welke dieren *ze/gezien/hadden*.

- (65) John asked which flowers they saw and Bill *asked* which animals *they/saw*.

Jan vroeg welke bloemen ze gezien hadden en Bill *vraagde* welke dieren *ze/gezien/hadden*.

- (66) a. *Stories about Frankenstein terrified John and *stories* about Dracula *terrified* Peter.

*Verhalen over Frankenstein maakten Jan bang en *verhalen* over Dracula *maakten* Peter *bang*.

- b. *Books about linguistics were reviewed by Bill and *books* about psychology *were/reviewed* by Peter.

*Boeken over linguïstiek werden becritiseerd door Bill en *boeken* over psychologie *werden* *becritiseerd* door John.

- (67) a. *Charles lost a picture of his mother and Peter *lost/a/picture* of his father.

*Charles heeft een foto van zijn moeder verloren en Peter *heeft/een/foto* van zijn vader *verloren*.

- b. *Bill destroyed an article about sex and Peter *destroyed/an/article* about politics.

*Bill heeft een artikel over sex vernietigd en Peter *heeft/een/artikel* over politiek *vernietigd*.

- (68) a. Charles took a picture of the queen and Bill *took/a/picture* of the king.

Charles nam een foto van de koningin en Bill *nam/een/foto* van de koning.

b. Bill wrote an article about sex and Peter
 wroet/een/artikel over sex en Peter

Bill schreef een artikel over sex en Peter
 schreef/een/artikel over politiek.

(69) John found Bill's book and Peter
 vond Harry's boek.

*Jan vond Bills boek en Peter
 vond Harries boek.

The parallelism between Gapping and WH-movement cases shows that the variables of both rules may not relate major constituents on either side of a NP-boundary. Note that the NP constraint overlaps partly with the Major Constituent Condition (see 1.1.), which excludes (58), (59), (61), (66), (67) and (69), but not (56) and (64).

2.1.3. THE WH-ISLAND CONSTRAINT

WH-constituents are allowed to move out of tenseless sentences, unless these sentences are introduced by a WH-complementizer:

(70) What did John want to cook today?
 Wat is Jan van plan vandaag te koken?

(71) *What did John wonder when to cook?
 *Wat vroeg Jan zich af wanneer te koken?

As regards Gapping, the remnants may be in different tenseless sentences, see (72), unless, again, these sentences are introduced by a WH-complementizer, see (73):

(72) a. John wants to cook the meals today and Peter
 wil/een/eten vandaag en Peter
 Jan is van plan vandaag eten te koken en Peter
 is/van/plan morgen eten te koken.

- b. John tried to interview some candidates this morning and Peter *ʔʔiɛd/ɛd/ɪnɛɛɪɪw/ɛdɛ* *ɛɛɪɪdɛɛɛ* this afternoon.

Jan probeerde vanmorgen met enkele kandidaten te praten en Peter *ɛɛɛɛɛɛɛɛ* vanmiddag *ɛɛɛ/ɛɛɛɛɛ* *ɛɛɪɪdɛɛɛɛ/ɛɛ/ɛɛɛɛɛ*.

- (73) a. *John wondered what to cook today and Peter *ɛɛɛɛɛɛɛ/ɛɛɛɛ/ɛd/ɛɛɛ* tomorrow.

*Jan vroeg zich af wat vandaag te zullen koken en Peter *ɛɛɛɛɛ/ɛɛɛɛ/ɛɛ/ɛɛɛ* morgen *ɛɛ/ɛɛɛɛɛ/ɛɛɛɛ*.

- b. *John asked which candidates to interview this morning and Peter *ɛɛɛɛɛ/ɛɛɛɛɛ/ɛɛɪɪdɛɛɛɛ/ɛd* *ɪnɛɛɛɛɛɛ* this afternoon.

*Jan vroeg met welke kandidaten 's morgens te kunnen praten en Peter *ɛɛɛɛɛ/ɛɛɛ/ɛɛɛɛ/ɛɛɪɪdɛɛɛɛ* 's middags *ɛɛ/ɛɛɛɛɛ/ɛɛɛɛɛ*.

The variables of Gapping and WH-movement thus may not contain a WH-complementizer, an assumption which is referred to as the WH-island Constraint (cf. Chomsky 1977, 80).

The effects of the WH-island Constraint can be seen in tensed sentences as well, cf. (74) and (75):

- (74) *What did you wonder who he sent?

*Wat vroeg je je af wie je gestuurd had?

- (75) *Peter wondered what he sent to Mary, and John *ɛɛɛɛɛɛɛ/ɛɛɛɛ/ɛɛ/ɛɛɛ* to Sue.

*Peter vroeg zich af wat hij aan Mary gestuurd had en Jan *ɛɛɛɛɛ/ɛɛɛɛ/ɛɛ/ɛɛɛ/ɛɛɛ* aan Susan *ɛɛɛɛɛɛɛ/ɛɛɛ*.

A comparison of these examples and the non-WH-island variants, however, reveals that the ungrammatical output of Gapping in (75) is due to a more fundamental cause:

(76) What did you tell her that you sent to Mary?

Wat vertelde je haar dat je aan Marie gestuurd had?

(77) *Peter told her that he sent something to Mary, and John ~~told her that he sent something~~ to Sue.

*Peter vertelde haar dat hij iets aan Marie gestuurd had en Jan ~~vertelde haar dat hij iets~~ aan Susan ~~gestuurd had~~.

We will return to these cases below in section 2.1.5. on the Tensed S Condition. In the meantime, we conclude that, outside (76) and (77), WH-movement and Gapping are sensitive to the WH-island Constraint.

(Some native speakers doubt the ungrammaticality of the English example in (77). They consider a variant of (77) in which that is deleted fully grammatical. Presumably the fact that that is optional in English and the semi-grammaticality of (77) are related. More will be said about this below, in section 2.2.5.2.)

2.1.4. THE SENTENTIAL SUBJECT CONSTRAINT

Gapping does not obey the Sentential Subject Condition formulated in Ross (1967, 134) as follows:

(78) The Sentential Subject Constraint

No element dominated by an S may be moved out of that S if that node S is dominated by an NP which itself is immediately dominated by S.

Compare the WH-examples of (79) with the gapped sentences of (80).

- (79) a. *Who was that the principal would fire (t)
expected by the reporters?
*Wie werd dat de directeur (t) zou ontslaan door
de reporters verwacht?
- b. *How much bread has that you took been listed
by Peter?
*Hoeveel brood is dat je genomen hebt door Piet
opgeschreven?

- (80) a. Which women the principal would fire was known
by the reporters and which men ~~the/principal~~
~~would/fire/was/known~~ by the publishers.

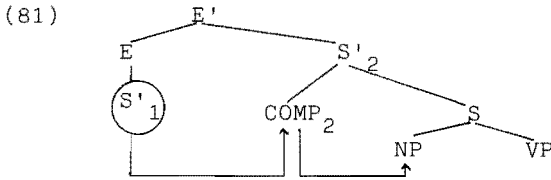
Welke vrouwen de directeur zou ontslaan was
bekend aan de reporters en welke mannen
~~de/directeur/zou/ontslaan/was/bekend~~ aan de
uitgevers.

- b. How much bread you took has been listed by Peter
and how much wine ~~you/took/was/been/listed~~
by John.

Hoeveel brood je genomen hebt is door Piet
opgeschreven en hoeveel wijn ~~je/genomen/hebt~~
~~is~~ door John ~~opgeschreven~~.

Since (79) is ungrammatical and (80) is grammatical, in order to maintain the parallelism between Gapping and WH-movement an explanation of this difference should be offered.

Such an explanation is possible within the analysis of subject sentences provided by Koster (1978a, 59). He presents several arguments in favor of the claim that subject sentences do not expand from subject NPs, but rather from a position E, which is available in root sentences only:



The subject sentence S'_1 in E-position is linked to the subject NP position via COMP, as indicated in (81). There is no way to derive (79) from an underlying structure such as (81), since there is no COMP position available to the left of the sentential subject. For Gapping this extra COMP is not required. The grammaticality of (80) only shows that Gapping applies on E' domains as well.

2.1.5. THE TENSED S CONDITION

Ross' constraints (Ross 1967) define the scope of variables: a variable may not enter an island. Chomsky's constraints (Chomsky 1973) are formulated differently: they determine which X and Y specified by a rule can be involved in it. This yields the following formalization of the island character of tensed sentences (Chomsky 1973, 244):

(82) The Tensed S Condition

No rule can involve X, Y in the structure

... X ... [α ... Y ...] ...

(i) where Y is not in COMP and α is a tensed sentence.

The condition "Y is not in COMP" implies that tensed sentences are semi-islands: the complementizer position of embedded tensed sentences is excluded from the condition. This proviso is known as the "COMP-escape-hatch". It explains the difference between bounded and unbounded movements observed by Ross. WH-movement, which moves a constituent to the COMP position, may escape, but Adverb Preposing and Extrapo-

sition, which have no COMP target, may not. Thus (83b) derives from (83a), but (84b) does not derive from (84a) (but rather from a different underlying structure).

(83) a. You told me [_S [_{COMP} what] you saw] |
 ^-----|

b. What did you tell me that you saw?

(84) a. You told me [_S [_{COMP} that] before dark, everybody
 ^-----x-----|

would leave.

b. Before dark, you told me that everybody would leave.

For Gapping, the Tensed S Condition claims that tensed sentences cannot contain one of the remnants but not the other, unless the remnant contained in the tensed sentence is in COMP. This accounts for the difference between (85) and (86):

(85) a. Charles may decide which boys are coming along and Max ~~may/decide~~ which girls ~~are/coming/along~~.

Karel mag beslissen welke jongens er mee gaan en Max ~~mag/beslissen~~ welke meisjes ~~er/mee/gaan~~.

b. The first letter says how much tax you should pay and the second letter ~~says~~ how much V.A.T. ~~you/should/pay~~.

In de ene brief staat hoeveel belasting je moet betalen en in de andere brief ~~staat~~ hoeveel BTW ~~je/should/pay~~.

(86) a. *Charles decided that 20 boys are coming along and Harrie ~~decided/that~~ 30 girls ~~are/coming/along~~.

*Karel besliste dat er 20 jongens mee zouden gaan en Harrie ~~besliste/dat/er~~ 30 meisjes ~~mee/zouden/gaan~~.

- b. *The first letter says that you should pay tax and the second letter *ʒəʔʒ/ʔhəʔ/ʔʔə/ʒhəʔʔə/ʔəʔ* V.A.T.

*In de ene brief staat dat je belasting moet betalen en in de andere brief *ʒʔəʔʔ/əʔʔ/ʔʒ* BTW *həʔʔʔ/ʔʒʔəʔʔʔ*.

In both (85) and (86), the remnants are in different tensed sentences, but in (85) one of the remnants is in the COMP position of the embedded tensed S, and thereby escapes the Tensed S Condition. In this respect, Gapping and WH-movement obey the Tensed S Condition in the same way. A difference between these rules, however, was observed in section 2.1.3., above. This difference may be illustrated by (87) and (88) (parallel to (76) and (77)).

(87) What did Max say that you should buy?

Wat zei Max dat je moest kopen?

(88) a. *Max said that you should buy bread and Peter *ʒəʔʔ/ʔhəʔ/ʔʔə/ʒhəʔʔə/ʔəʔ* wine.

*Max zei dat je brood moest kopen en Peter *ʒʔʔ/əʔʔ/ʔʒ* wijn *həʔʒʔʔ/ʔʔʔʔʔ*.

b. *To Sue, Max said that you should buy bread and to Ann, *Max/ʒəʔʔ/ʔhəʔ/ʔʔə/ʒhəʔʔə/ʔəʔ* wine.

*Tegen Susan zei Max dat je brood moest kopen en tegen Ann *ʒʔʔ/Max/əʔʔ/ʔʒ* wijn *həʔʒʔʔ/ʔʔʔʔʔ*.

In both (87) and (88), X and Y are separated by the string ...said (Max) that you.... The explanation of the divergence in grammaticality can be found in successive cyclicity: the WH-constituent in (87) moves via the COMP of the embedded tensed sentence to the COMP of the root sentence, as schematically illustrated in (89):

(89) $|_{S,COMP}$ did Max say $|_{S,COMP}$ you should buy what||
 $\uparrow \quad \quad \quad \uparrow$

Gapping is not a movement rule. It cannot apply successively cyclicly, and hence the differences between Gapping and WH-movement as exemplified by (87) and (88) are predicted.

In the original context of the Tensed S Condition a second blocking condition for structure (82) was mentioned (Chomsky 1973, 244):

(82') ...,

(ii) where Y is in COMP and X is not in COMP

This condition prohibits (in an ad hoc manner) movement out of COMP to a position other than the COMP of the matrix clause. Thus, (90) cannot be derived, whereas (91) can:

(90) *Which dog is believed by Max that Sue saw?

(90') [_S [_{COMP} NP is bel. by Max [_S [_{COMP} Sue saw wh-dog]]]

(91) Which dog is it believed that Sue saw?

(91') [_S [_{COMP} is it believed [_S [_{COMP} Sue saw wh-dog]]]

Assume now that the COMP-COMP condition (82') is applicable to Gapping. In this case (85) will be ruled out, since both remnants X and Y are in different tensed sentences, but not in COMP position, cf.:

(85') [_S [_{COMP} ...] ...X... [_S [_{COMP}^Y] ...]]

On the other hand, (92) structured as

(92') [_S [_{COMP}^X] ... [_S [_{COMP}^Y] ...]]

will not be ruled out. Unfortunately, (85) is as grammatical as (92), showing that the difference illustrated by (85') and (92') is irrelevant to Gapping:

- (92) a. Who decides which boys are coming along and who
 decides which girls are coming along?

Wie beslist welke jongens er mee gaan en wie
 beslist welke meisjes er mee gaan?

- b. Which letter says how much tax you should pay and
 which letter says how much V.A.T. you should pay?

In welk boek staat hoeveel belasting je moet
 betalen en in welk boek staat hoeveel BTW
 je moet betalen?

The difference, however, only goes to show that the COMP-COMP condition must be restricted to movement rules. In fact, an account in this direction is provided by Vergnaud (1974, 143). He presents a definition of structure preservingness which predicts the COMP-COMP condition. It is obvious that structure preservingness holds for movement rules only, and not for Gapping. Alternatively, the COMP-COMP condition for movement rules may follow from conditions on anaphoric relations, see May (1979, 19). In that case, the difference between movement rules and Gapping is also quite naturally explained, and (85) comes as no surprise.

Finally, some might wonder whether (92) and (85) are actual examples of reduction by Gapping, since there exists another deletion rule with roughly the required effect, the rule of Sluicing proposed by Ross (1969). This rule deletes all material to the right of the complementizer. Its effect can be exemplified by (93):

- (93) a. Ralph is going to invite somebody from Kankakee
 to the party, but they don't know who
 he is going to invite to the party.

Ralph neemt iemand uit Kankakee mee naar het
 feest, maar ze weten nog niet wie Ralph er mee naar
 toe gaat.

- b. It is clear that you should pay tax, but
you can only guess how much *yɔʋ/ʂhɔʋɪd/pɔɔ*.

Het staat vast dat je belasting moet betalen,
maar je kunt alleen maar raden hoeveel
ʃɛ/ʈɔɛɛ/ʋɛɛɪɛɛ.

It seems then that (92) and (85) can be derived by a combination of Gapping and Sluicing. However, it can be shown in several ways that this account is incorrect. First, consider the fact that for (85) and (92) to involve Sluicing the intermediate stage has to be grammatical as well, since both Sluicing and Gapping are optional rules. This prediction turns out to be wrong: most informants reject these sentences, since for them Sluicing applies in contrastive contexts such as (93) only. Cf. (94):

- (94) a. ?*Charles may decide which boys are coming along
and Max may decide which girls *ɛɛɛ/ɔɔɪɪɪɪɪɪ/ɔɪɔɪɪɪɪ*.

?*Karel mag beslissen welke jongens er mee gaan en
Harry mag beslissen welke meisjes *ɛɛ/ʈɔɛɛ/ɛɛɛɛ*.

- b. ?*The first letter says how much tax you should pay
and the second letter says how much V.A.T.
yɔʋ/ʂhɔʋɪd/pɔɔ.

?*In het ene boek staat hoeveel belasting je moet
betalen en in het andere boek staat hoeveel BTW
ʃɛ/ʈɔɛɛ/ʋɛɛɪɪɪɪ.

Second, note that Sluicing does not apply in indirect exclamations, neither in the "classical" context of Sluicing (95a), nor in coordinations (95b) (the importance of such constructions was pointed out by Frans Zwarts in a lecture at the TIN-meeting 1979):

- (95) a. *I could tell by the color of his hair that he was a lover of music, but I could not tell what a lover of music *hɛ/wʌʃ*.

*Ik kon aan de kleur van zijn haar zien dat hij een muziekliefhebber was, maar ik kon niet zien wat een muziekliefhebber *hɪʃ/wʌʃ*.

- b. *By the color of his hair you can tell what a lover of music he is and by the shape of his cheeks you can tell what a gastronome *hɛ/ɪʃ*.

*Aan de kleur van zijn ogen kun je zien wat een muziekliefhebber hij is en aan de vorm van zijn wangen kun je zien wat een smulpaap *hɪʃ/ɪʃ*.

Gapping in indirect exclamations, on the other hand, is grammatical:

- (96) By the color of his hair you can tell what a lover of music he is and by the shape of his cheeks *ʃɒʌ/ɔʌh/tɛɪ* what a gastronome *hɛ/ɪʃ*.

Aan de kleur van zijn ogen kun je zien wat een muziekliefhebber hij is en aan de vorm van zijn wangen *kʌh/ʃɛ/zɪɔh* wat een smulpaap *hɪʃ/ɪʃ*.

Therefore, (96) is a genuine case of Gapping.

Third, observe that Sluicing deletes the string immediately contiguous to the COMP node, cf.

- (97) a. John knows that the boys are leaving but he does not know when *tʰɛ/vɒʃʃ/ɔrɛ/ɪɔɔvɪŋ*.

Jan weet dat de jongens vertrekken, maar hij weet niet wanneer *ɔɛ/ʃɒŋɔɔhʃ/vɛrrɛkkɛh*.

- b. *John knows that the boys are leaving but he does not know when the girls *ɔrɛ/ɪɔɔvɪŋ*.

*Jan weet dat de jongens vertrekken, maar hij weet niet wanneer de meisjes *vɛrrɛkkɛh*.

The second gap in examples such as (98) therefore cannot be the result of Sluicing. Variants of (98) with only the "sluiced" gap are ungrammatical, cf. (99).

- (98) ?John may decide when the girls are leaving and
Peter ~~may/decide~~ when the boys ~~are/leaving~~.

Jan mag beslissen wanneer de meisjes vertrekken
en Piet ~~mag/beslissen~~ wanneer de jongens ~~vertrekken~~.

- (99) *John may decide when the girls are leaving and
Peter may decide when the boys ~~are/leaving~~.

*Jan mag beslissen wanneer de meisjes vertrekken
en Piet mag beslissen wanneer de jongens ~~vertrekken~~.

The weak grammaticality of the English example in (98) is presumably due to the fact that in English gapped sentences with more than two remnants are low in quality anyway. Additionally, it must be pointed out that the gapped pattern of (98) is highly limited. Examples are relatively most felicitous when the third remnant is contiguous to the second one. (100), e.g., is considered ungrammatical almost universally:

- (100)?*John may decide when we will go to Paris and Peter
~~may/decide~~ when ~~we/will/go~~ to London.

?*Jan mag beslissen wanneer we naar Parijs gaan en
Piet ~~mag/beslissen~~ wanneer ~~we~~ naar London ~~gaan~~.

Be this as it may, the comparison of (98) on the one hand and (97b) and (99) on the other strongly suggests that the second gap in (98) is the result of Gapping, not of Sluicing.

In sum, the observations in this section show that Gapping is a respectable rule of sentence grammar. Gapping parallels WH-movement in important respects: both rules were shown to be constrained by the Tensed S Condition (plus COMP-escape-hatch), the NP Constraint, and the WH-island Constraint. WH-movement, but not Gapping, was found to obey the

COMP-COMP condition, and the Sentential Subject Condition, but it was pointed out that recently the latter have been claimed to have an alternative source (either structure preservingness or a constraint on anaphoric relations), or follow from an alternative analysis of the structural position of subject sentences. If so, the parallelism between Gapping and WH-movement is adequately described by the underscored triplet.

2.2. EFFECTS ON THEORY

In Chomsky and Lasnik (1977) and Chomsky (1978), several generalizations over the constraints on rules of sentence grammar discussed in the previous sections have been proposed. The constraints on WH-movement are claimed to be partly due to the syntactic constraint of Subjacency, and partly to the so-called Binding Conditions: the Nominative Island Constraint and Opacity. Subjacency is relevant to movement rules. The Binding Conditions apply to rules of construal (e.g. indexing rules). The following subsections will show that the proposed generalizations fail to account for the parallelism between Gapping and WH-movement observed in the previous section.

2.2.1. SUBJACENCY

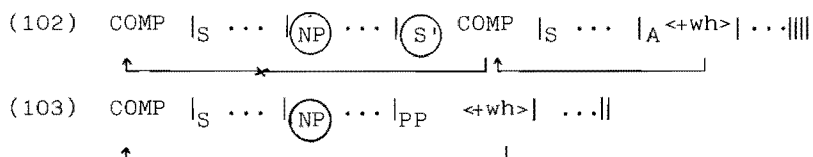
Subjacency is formulated as follows (Chomsky 1977, 73):

(101) Subjacency

"... a cyclic rule cannot move a phrase from position Y to position X (or conversely) in (6):

(6) ...X... $|\alpha...$ $|\beta...Y...$...| ...X...,
where α and β are cyclic nodes.

In Chomsky (1973) S' and NP were assumed to be cyclic. Under this assumption, Subjacency subsumed the Complex NP Constraint (the contents of which is represented schematically in (102)), but not the NP Constraint (schematically represented in (103) (circled nodes are cyclic)):



This implies that in Chomsky (1973) movement of a PP out of a NP, such as in (104) is considered to be the unmarked (un-exceptional) case:

(104) a. Of whom did John take a picture?

Van wie heeft Jan een foto genomen?

b. About what did John write an article?

Waarover heeft Jan een artikel geschreven?

Bach and Horn (1976), on the other hand, claim that the examples in (104) are exceptional, and that in the unmarked cases, no element may be moved out of a NP. They sustain their claim with examples such as (105) (slightly adjusted for expository purposes):

(105) a. *Of whom did John destroy pictures?

*Van wie heeft Jan foto's vernietigd?

b. *About whom did stories terrify John?

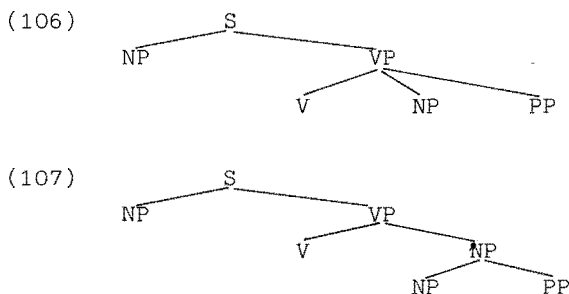
*Van wie maakten verhalen Jan bang?

c. *Of whom did John see Peter's picture?

*Van wie zag Jan Piets foto?

- d. *With what did John buy a book?
 (Answer: With a golden jacket.)
- *Waarmee heeft Jan een boek gekocht?
 (Antwoord: Met een gouden kauft.)

As observed in section 2.1.2., for those cases where a PP moves out of a NP, such as (104), Bach and Horn assume a difference in structure: the examples in (104) will have a deep structure such as (106), whereas (105) will have (107) as its deep structure:



Under this assumption (104) will not be a counterexample to the NP Constraint.

In Chomsky (1977) this analysis of the sentences (104) and (105) is accepted *grosso modo*. He prefers, however, a readjustment rule to account for the difference in structure. This readjustment rule effects the following change (where the original position of PP is indicated by trace *t*):

(108) He saw $|_{NP}$ a picture $|_{PP}$ of John||
 \Rightarrow he saw $|_{NP}$ a picture $t|$ $|_{PP}$ of John|

This readjustment is sensitive to:

- (i) the lexical contents of V (105a);
- (ii) the position of the NP in the tree: subjects may not be readjusted (105b);
- (iii) the contents of the determiner of the NP (105c); and
- (iv) the choice of the preposition (105d).

Though Chomsky (1977) agrees that questioning of a PP out of a NP represents the marked rather than the unmarked situation, he does not agree with Bach and Horn's NP Constraint. He puts forward examples such as (109), which "immediately falsify" it (Chomsky 1977, 112):

(109)

a. A review was published of Bill's book.

$[_S, \text{COMP } [_S [_{NP} \text{ a review } t_i] \dots [\text{of B's book}]_{PP_i}]]$

b. Of the students in the class several failed the exam.

$[_S, \text{COMP } [_S [\text{of the students } \dots]]_{PP_i} [_{NP} \text{ several } t_i] \dots]]$

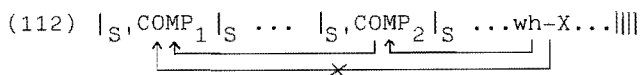
By the NP Constraint, movement of PP out of NP as in (109) is incorrectly prohibited. On this situation, Chomsky comments that there is a fundamental difference between WH-movement and other movement rules (such as the ones exemplified in (109)). Again, he accounts for this difference in terms of Subjacency, although the account is based on a slight redefinition of the set of cyclic nodes: S and NP are suggested to be cyclic. Subjacency will allow movement of a daughter of a NP to any position within S (as in (109)), but not to COMP, which is outside of S:

(110) $[_S, \text{COMP } [_S \text{ (S) } \dots [_{NP} \text{ (NP) } \dots \text{PP}]] \dots]]$

Nothing is lost by this redefinition of the set of cyclic nodes. The Complex NP Constraint still holds, as shown in (111):

(111) $[_S, \text{COMP } [_S \text{ (S) } \dots [_{NP} \text{ (NP) } \dots [_S, \text{COMP } [_S \dots \text{wh-X} \dots]]]]]$

In actual fact, something is gained, since the WH-island Constraint now follows from Subjacency:



If COMP_2 is filled, constituent X cannot move to this position. X cannot move to COMP_1 either, since this assumes that two cyclic boundaries can be crossed in one swoop.

Let us consider the effect of Subjacency on Gapping cases. Since Gapping obeys the (Complex) NP and the WH-island Constraints, one expects that the scope of Gapping follows from Subjacency (101). It does not, however. On the one hand there are ungrammatical gappings such as (113), where the remnants are in subjacency distance from one another, and on the other hand there are grammatical gappings where the distance between the remnants violates Subjacency, as in (114):

(113) a. Complex NP Condition

*John discussed the question of which roses are to be planted and Peter ~~discussed the question~~ (of) which apple trees ~~are to be planted~~.

*Jan besprak de vraag welke rozen geplant moesten worden en Peter ~~besprak de vraag welke appelbomen geplant moesten worden~~.

b. NP Constraint

*Charles destroyed an article about the moon and Peter ~~destroyed an article~~ about the sun.

*Karel vernietigde een artikel over de maan en Piet ~~vernietigde een artikel~~ over de zon.

c. WH-island Constraint

*John asked what to write to Mary, and Peter ~~asked what to write~~ to Sue.

*Jan vroeg wat aan Marie te moeten schrijven en Peter ~~vraagde wat aan Susan te moeten schrijven~~.

(114) Subjacency

- a. Charles seems to believe to be able to say yes,
and John *seems to believe to be able to say* no.

Karel schijnt te geloven in staat te zijn ja
te zeggen, en Jan *schijnt te geloven in staat te zijn*
nee te zeggen.

- b. John wants to try to begin to write a novel and
Sue *wants to try to begin to write* a play.

Jan wil proberen te beginnen een novelle te
schrijven en Sue *wil proberen te beginnen* een
toneelstuk te schrijven.

In (113), only one cyclic node separates the remnants: NP in the (Complex) NP Constraint cases and S in the WH-island cases. The examples in (114) show on the other hand, that an arbitrary amount of S-boundaries can be contained in the variable. Subjacency is too strong for gappings of type (114) and too weak for gappings of type (113). This shows that the attempts to derive the NP-Constraint and the WH-island Constraint from some version of Subjacency has not (yet) met with success, granted that no derivation of the two constraints can be called successful if it does not include the Gapping cases.

2.2.2. BINDING CONDITIONS

By virtue of the development of trace theory, movement rules can be considered to be constrained by binding conditions on anaphora: the moved constituent and its trace are taken to be antecedent and anaphor, respectively. From this perspective it becomes possible to exclude both examples in (115) by the same constraint on the relation between they and each other in (a), and they and t in (b):

- (115) a. *They_i believed Tom to have criticized each other_i
 b. *They_j were believed Tom to have criticized t_j.

Chomsky (1978) proposes two conditions which "bind" the interpretation of anaphora (empty nodes and reciprocal phrases): the Nominative Island Condition (Chomsky 1978, 48) and Opacity (Chomsky 1978, 17):

(116) The Nominative Island Constraint

A nominative anaphor cannot be free in S'.

(117) Opacity

If α is in the domain of the subject of β ,
 β minimal, then α cannot be free in β .

"Free" is "unbounded", i.e. not coindexed with an antecedent. α abbreviates for anaphora (pro, trace, and reciprocal, Chomsky (1978, 13)). β is S' (p.18). "In the domain of" is equal to "c-commanded by". C-command is defined as follows (Reinhart 1976, 32):

(118) C-command

Node A c(onstituent)-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B.

i.e., a node α is in the domain of a node γ if it is dominated by the first branching category dominating γ .

Nominative case is assigned to the subject of a tensed sentence, but not to the subject of a tenseless sentence. The Nominative Island Condition uses this distinction and prohibits subjects of tensed sentences from being empty. This predicts the following pattern:

- (119) John seems [_S COMP [_S [_{NP} e] to be ill]]
 Jan schijnt ziek te zijn.

(120) *John seems $|_S, |_{COMP(that)}| |_{NPe}|$ is ill

*Jan schijnt dat ziek is.

Both in (119) and in (120) $|_{NPe}|$ is free in S' , since there is no antecedent in S' . In (120), but not in (119) $|_{NPe}|$ is nominative and therefore (120), but not (119) is excluded by the Nominative Island Condition.

In effect the Opacity Condition holds for constituents c-commanded by subjects, e.g. objects. Both in tensed and in tenseless sentences, objects are not allowed to be free in S' . This explains the difference between (121) and (122).

(121) It is unclear $|_S, |_{COMP^{what_i}}| |_S |_{NPe}|$ to do t_i

(122) *It is unclear $|_S, |_{COMP^{who_i}}| |_S t_i$ to do $|_{NPe}|$

In both cases t_i is bound in S' (by what_i and who_i); $|_{NPe}|$ is free in both cases. In (121) this empty node itself is the subject, and thereby not in the domain of the subject, and not excluded by Opacity. (122) is excluded by Opacity: $|_{NPe}|$ is in the domain of the subject (t_i), and not bound within S' .

Since COMP is not in the domain of the subject, it is an exceptional position. It follows that COMP may again function as an "escape hatch". This is shown by WH-movement, which, if applied successively cyclicly is the only rule to move a constituent out of a tensed sentence:

(123) Who_j do you think $|_S, |_{COMP t_{i,j}}| |_S t_i$ is ill

(124) Who_j do you think $|_S, |_{COMP t_{i,j}}| |_S$ we saw t_i

In (123), t_i is a nominative anaphor by virtue of its position, bound by $t_{i,j}$ in $\beta (=S')$. The trace in COMP ($t_{i,j}$) is free in S' , but not in the domain of the subject, and thus (123) is not excluded by Opacity. In this case, it must be assumed that $t_{i,j}$, unlike t_i , is non-nominative. Chomsky claims this to be so by stipulating that movement rules move

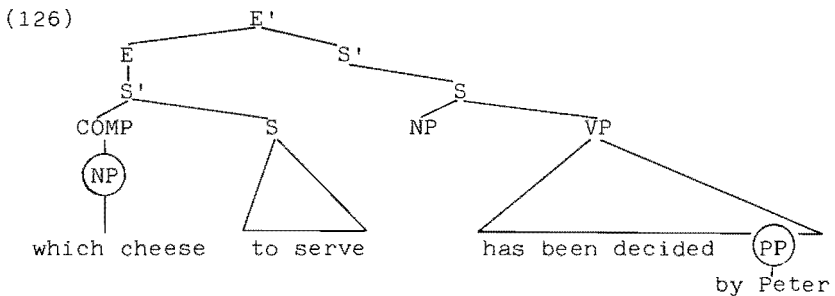
all features of a category, including case features (Chomsky 1978, 48). Still, t_i is assumed to be nominative, despite the application of WH-movement, because the position of t_i is inherently related to nominative case.

In (124), t_i is in the domain of the subject (we), but bound in S' by $t_{i,j}$, and thereby t_i escapes from the influence of Opacity. In this way, the Binding Conditions replace at least the Tensed S Condition, and the COMP-escape-hatch.

Let us consider the effect of the Binding Conditions on Gapping. There is no obvious reason for Gapping to be subject to either the Nominative Island Condition or Opacity, since the remnants it relates are not empty, and not necessarily anaphoric. Additionally, rules which are constrained by the Binding Conditions are considered to obey the condition of so-called Proper Binding (Fiengo 1974), which in its most recent version is defined in terms of c-command (Reinhart 1976). An antecedent, e.g., is said to properly bind an anaphor in case it c-commands the anaphor. The remnants of Gapping are not necessarily c-command related as shown by (125), structured as (126):

(125) Which wine to serve has been decided by John and which cheese ~~to serve~~ ~~has been decided~~ by Peter.

Welke wijn je moet aanbieden is door Jan beslist en welke kaas ~~je moet aanbieden~~ ~~is~~ door Peter ~~beslist~~.



Neither the first branching node dominating $|_{NP} \text{which cheese}|$ dominates $|_{PP} \text{by Peter}|$, nor the first branching node dominating $|_{PP} \text{by Peter}|$ dominates $|_{NP} \text{which cheese}|$. Thus it seems to be impossible to interpret the Binding Conditions as constraints on the remnants of Gapping.

For yet another reason it seems impossible to interpret the Binding Conditions as such. It was shown above that, outside the Tensed S cases, the Binding Conditions also replace the Specified Subject Condition. The latter constraint, however, does not restrict the application of Gapping. It may be worthwhile to consider this in some detail. In Chomsky (1973, 254) the Specified Subject Condition is formulated as follows:

(127) The Specified Subject Condition

No rule can involve X, Y (X superior to Y)
in the structure

... X ... $[\alpha \dots Z \dots - WYV \dots]$...

where Z is the specified subject of WYV.

(Subjects are specified in case they are lexically filled, or contain a proform which is not controlled by X. $\alpha = S'$ or NP).

The examples (128) illustrate the effect of this constraint:

(128) a. The men promised me to defeat each other.

De mannen beloofden me elkaar te verslaan.

b. * The men asked me to defeat each other.

* De mannen vroegen me elkaar te verslaan.

The reciprocal phrase each other (Y) in (128a) can be related to the men (X), since the men controls the empty subject of defeat. In (128b), the men does not control the empty subject

of defeat, and therefore, the men cannot be the antecedent of each other. (128b) is excluded, since the reciprocal phrase cannot find an antecedent.

The difference between (128a) and (b), structured as in (128'),

(128') a. The men promised me $|_S, |_{NP_e}|$ to defeat each other|

b. The men asked me $|_S, |_{NP_e}|$ to defeat each other|

is accounted for by Opacity as follows. The reciprocal phrase each other is in the domain of the subject $|_{NP_e}|$, and therefore must be bound in S'. Being the only NP available, $|_{NP_e}|$ "binds" each other. Lexical properties of promise require that the men be the antecedent of $|_{NP_e}|$ in (128a), thereby assigning identical indices to the men, $|_{NP_e}|$, and each other. Lexical properties of ask require that me be the antecedent of $|_{NP_e}|$ in (128b). Me, $|_{NP_e}|$, and each other thus are coIndexed, resulting in an uninterpretable structure, since the reciprocal phrase requires a plural antecedent.

The Specified Subject Condition has not been considered in earlier sections, since it is irrelevant to WH-movement. WH-movement provides no direct evidence for the Specified Subject Condition, but can be made compatible with the Specified Subject Condition by virtue of the COMP escape hatch. (First Y moves to COMP, passing over the specified subject Z in (127), and then it moves to X, passing over the cyclic boundary. WH-movement thereby does not involve X and Y, where X and Y are separated by both the subject Z and the cyclic boundary). Gapping appears to disobey the Specified Subject Condition, if the remnants are taken as X and Y, cf. (129).

- (129) a. Today, John wants to try to begin to write a novel, and tomorrow, *ʃɔhɔ/ʋaɪtɛ/ɛɔ/ɛrɪ/ɛɔ/bɛgɪɔ/ɛɔ/ʋrɪɛɛ* a play.

Vandaag wil Jan beginnen een novelle te schrijven en morgen *ʋɪɪ/ʃaɪ/bɛgɪɔɪnɛɔ* een toneelstuk *ɛɛ/ɛɔɪrɪʃɪɛɔ*.

- b. Some people want the door to open to the left, and others *ʋaɪt/ɛhɛ/ɔɔɔr/ɛɔ/ɔpɛɔ* to the right.

Sommigen willen de deur naar links laten openslaan en anderen *ʋɪɪɪɛɔ/ɔɛ/ɔɛɪr* naar rechts *ɪaɪɛɔ/ɔpɛɔɪaɪaɔ*.

- c. Some people want all doors to open to the left and others *ʋaɪt* all windows *ɛɔ/ɔpɛɔ/ɛɔ/ɛhɛ/ɪɛɪɛ*.

Sommigen willen alle deuren naar links laten openslaan en anderen *ʋɪɪɪɛɔ* alle ramen *ɪaɪr/ɪɪɪkɛ/ɪaɪɛɔ/ɔpɛɔɪaɪaɔ*.

The difference between promise and ask, which illustrates the Specified Subject Condition par excellence (cf. (128)) cannot be reproduced for Gapping (cf. (130)):

- (130) a. My mother promised me to talk to the director and my father *ɔrɔɔɪɛɛɔ/ɔɛ/ɛɔ/ɛɪɪk* to the dean.

Mijn moeder beloofde me met de directeur te praten en mijn vader *ɔɛɪɔɔɪɛɛ/ɔɛ* met de dekaan *ɛɛ/ɔrɛɛɛɛɔ*.

- b. My mother asked me to take counsel with the director and my father *aɛkɛɔ/ɔɛ/ɛɔ/ɛɪkɛ* *ɔɔɔɔɛɛɪ* with the dean.

Mijn moeder vroeg me met de directeur overleg te plegen en mijn vader *ɪrɔɔɛɛ/ɔɛ* met de dekaan *ɔɪɛɪɪɛɛ/ɛɛ/ɔɪɛɛɛɛɔ*.

In fact, one might present the following perspective on this problem. Ever since the introduction of traces in Chomsky (1973, 269 footnote), there have been attempts, increasingly successful, to derive constraints on rules of sentence grammar from constraints on empty positions, i.e. from constraints on bound anaphora. From the beginning, constraints on the scope of WH-movement constituted the pivot of expositions on the explanatory value of this approach. As a result of these discussions it has become more or less clear how WH-movement might fit into a theory of sentence grammar constrained by conditions on bound anaphora. Within this view it is not obvious why Gapping and WH-movement should obey similar constraints. Nevertheless they do. The preceding sections not only legitimized Gapping as a fully regular, island-sensitive rule of sentence grammar, they surfaced at the same time striking parallels between the scope of Gapping and the scope of WH-movement.

This leaves one, then, with questions about the source and interpretation of these parallels, about whether the empty positions in gapped sentences will or will not constrain the rule, whether the remnants will refer to empty positions in Logical Form, or whether the variable between the remnants will be subject to constraints on Gapping and WH-movement as well.

Three recent publications on Dutch, Koster (1978b), Zwarts (1978), and Neijt (1978b) have considered these questions, i.e. they considered the relevance of Gapping for theories of general constraints on sentence grammar. Koster made an attempt to derive at least some constraints on Gapping from a theory of empty places, more or less in the spirit of Fiengo (1974, chapter 4). Neijt and Zwarts represent more old-fashioned syntax. They do not use empty places but derive the scope of Gapping from a generally defined scope of the syntactic variable. We will discuss Koster (1978b) and Zwarts (1978) below (sections 2.2.3. and 2.2.4. respectively), and will from there proceed with a more elaborately articulated version of Neijt (1978b) (section 2.2.5.).

2.2.3. THE BOUNDING CONDITION (KOSTER, 1978b)

The NP Constraint (Bach and Horn, 1976) outlawed any extraction from or deletion in NP. This constraint is reformulated by Koster (1978b) in order to exclude empty positions within NP unless they are bounded (i.e. find an antecedent) within that NP. Koster further generalizes this constraint such that it applies to NP, AP, PP, and S'. He defends this reinterpreted and generalized NP Constraint as a fundamental principle of core grammar: the Bounding Condition.

(131) The Bounding Condition (Koster 1978b, 123)

γ cannot be free in $[\beta \dots [\gamma_e] \dots]$
where β is a top node.

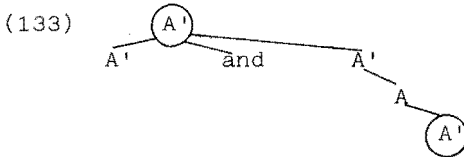
Top nodes are defined as follows:

(132) Top nodes (Koster 1978b, 105)

A maximal projection, X^n , is a top node iff it is not immediately dominated by a node X^m (of the same projection type) such that $m \geq n$.

Since S' is a top node and since empty places occur within S', the Bounding Condition allows for certain universal or language specific exceptions. If the top node is a tenseless S', the Bounding Condition is inapplicable and, e.g., an empty subject may be interpreted by a controller outside S'. If the empty position is marked as <+wh>, it may be interpreted by a wh-antecedent outside the top node in many languages. This way Koster recaptures all "empty position" facts mentioned in the recent literature. His statement makes an elegant distinction between core grammar, viz. the Bounding Condition with its straightlaced restrictions on distributional variation, and non-core grammar, the additional set of provisions that muddle the transparent original picture.

A remarkable and intended consequence of the definition of top node is that the label in the top of a conjunction is a "top node", whereas the labels in the top of the conjuncts themselves are not. In diagram (133)



only the circled A-nodes count as top nodes by the definition. As a consequence the empty position $[_{ve}]$ in (134) can be considered as "bound" or "interpretable" by the verb in the first conjunct. The empty positions in structures (135a) and (135b) below, however, are not in each separate case bounded under their own top nodes, which may explain their ungrammaticality. (The S-bars mentioned in (134) and (135) are top nodes).

(134) $[_S, \text{John hit Mary and Bill } [_{ve}] \text{ Sue}]$.

(135) a. $*[_S, \text{John hit Mary and I don't believe } [_S, \text{Bill } [_{ve}] \text{ Sue}]]$.

b. $*[_S, \text{John says that he eats an apple and Max } [_{ve}] [_S, \text{COMP } [_{NP^e}] [_{ve}] \text{ a pear}]]$.

Since the Bounding Condition is weakened for tenseless sentences the following structure is allowed:

(136) $[_S, \text{John wanted to invite Mary and Peter } [_{ve}] [_S, \text{COMP } [_{NP^e}] [_{ve}] \text{ Sue}]]$.

In the same vein, the Bounding Condition explains why the variable in Gapping cannot cover parts of a major phrase, as in:

(137) John was standing in front of his house, and Peter
 $|_V^e| \ |_{PP}|_P^e| \ |_{NP}^{his \ car}|$.

Jan stond voor zijn huis en Peter
 $|_V^e| \ |_{PP}|_P^e| \ |_{NP}^{zijn \ auto}|$.

The Bounding Condition thus strongly restricts the form of the remnants of Gapping, e.g., it subsumes the Major Constituent Condition, discussed favorably in the first part of this chapter.

While the Bounding Condition thus achieves a large measure of success, it is less successful in cases such as (138), where it predicts ungrammaticality for a grammatical sentence (in which S' is tensed), and (139) (in which S' is tenseless), where it predicts just the opposite:

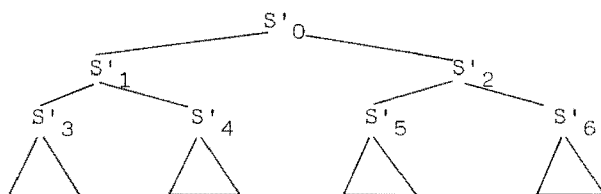
(138) John asked $|_S, \text{which apples he should eat}|$ and
 Peter $|_V^e| \ |_S, \text{which pears}| \ |_{NP}^e| \ |_{AUX}^e| \ |_V^e|$.

(139) *John wondered $|_S, \text{who to invite for dinner}|$ and
 Peter $|_V^e| \ |_S, \ |_{COMP}^e| \ |_V^e| \ \text{for lunch}|$.

Although one might object that the ungrammaticality of (139) may follow from other principles and does not falsify the Bounding Condition, it is ominous that the grammatical (138) shows the very characteristics ruled out by the condition. In the analysis that we will give in section 2.2.5., both facts, (138) and (139) will be seen to follow directly from an appropriately defined notion of Subjacency.

The notion "top node" itself is not without problems either. If we consider a structure such as (140), only the S'_0 will be a top node. This seems to imply that all Gapping patterns of (141) are allowed.

(140)

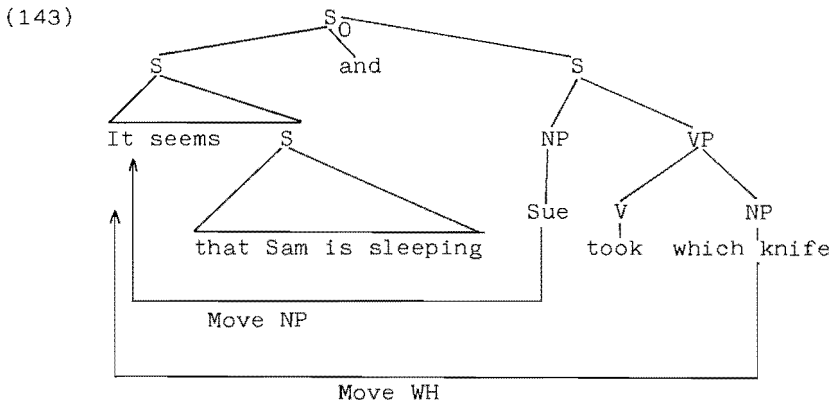


- (141) a. $[_0 [_1 [_3 \text{NP V NP}] [_4 \text{NP e NP}]] [_2 [_5 \text{NP e NP}] [_6 \text{NP e NP}]]]$
 b. $[_0 [_1 [_3 \text{NP V NP}] [_4 \text{NP e NP}]] [_2 [_5 \text{NP V NP}] [_6 \text{NP e NP}]]]$
 c. $*[_0 [_1 [_3 \text{NP V NP}] [_4 \text{NP V NP}]] [_2 [_5 \text{NP e NP}] [_6 \text{NP e NP}]]]$
 d. $*[_0 [_1 [_3 \text{NP V NP}] [_4 \text{NP e NP}]] [_2 [_5 \text{NP e NP}] [_6 \text{NP V NP}]]]$
 e. $*[_0 [_1 [_3 \text{NP V NP}] [_4 \text{NP V NP}]] [_2 [_5 \text{NP e NP}] [_6 \text{NP V NP}]]]$

This structure was discussed by Williams (1978) (cf. also chapter 1, section 2.1.6.), and there is no doubt that the variants (c) - (e) are ungrammatical, cf.:

- (142) a. John wants brandy and Max ~~wants~~ beer, or Max ~~wants~~ brandy and John ~~wants~~ beer.
 b. John wants brandy and Max ~~wants~~ beer, or Max wants brandy and John ~~wants~~ beer.
 c. *John wants brandy and Max wants beer, or Max ~~wants~~ brandy and John ~~wants~~ beer.
 d. *John wants brandy and Max ~~wants~~ beer, or Max ~~wants~~ brandy and John wants beer.
 e. *John wants brandy and Max wants beer, or Max ~~wants~~ brandy and John wants beer.

Furthermore if S_0 in structure (143) is the sole top node, one would expect there to be rules extracting a constituent from one of the conjuncts and insert it in the other. No such phenomenon exists.



The following morals appear warranted. The Bounding Condition and its auxiliary principles cover the empty position facts explained earlier by several alternative principles. The notion "top node" was stretched for coordinated structures in order to bring the Gapping facts under the explanatory scope of the Bounding Condition. In this way the Bounding Condition gets "excess content" over its competitors (Lakatos 1970, 124, and 1976, 96). However, the stretched notion top node runs into serious difficulties if one considers coordinations with more than two conjuncts, such as (141). Furthermore, the rule scope defined by this notion enjoys a striking lack of support from non-Gapping phenomena, such as extractions from one conjunct, cf. (143). And even if we invoke independent principles to exclude the unwanted results sketched in (141) and (143), this does not solve the more fundamental problem of the lack of evidence for the stretched notion "top node". Over and above this, if we allow the notion top node as defined and in spite of its difficulties, some Gapping facts ((138) and (139)) seem to falsify rather than to confirm the Bounding Condition.

This criticism of Koster (1978b) is only marginally relevant if one feels that the Bounding Condition is sufficiently supported by independent evidence and does not require "excess content" in order to be acceptable. Even then, the framework of Koster (1978b) cannot be claimed to have explained why Gapping is a rule of sentence grammar.

2.2.4. A PROPOSAL BY ZWARTS (1978)

A key observation in Zwarts (1978) concerns the following Dutch construction.

(144) De veiligheidsagent stond [_P² [_Q² vijf meter]
[_P, achter de grootvorstin]].

(The body-guard was standing five meters
behind the duchess.)

The single phrase P^2 vijf meter achter de grootvorstin can function as a remnant of Gapping, cf. (145), and can be questioned by WH-movement, cf. (146).

(145) De ene veiligheidsagent stond twee meter achter de
grootvorstin en de andere veiligheidsagent
~~stond~~ [_P² [_Q² twee meter] [_P, achter de koningin]].

(One body-guard was standing two meters behind the
duchess and the other body-guard ~~was/standing~~ two
meters behind the queen.)

(146) Hoeveel meter achter de grootvorstin stond de
veiligheidsagent?

(How many meters behind the duchess was
the body-guard?)

At the same time, the Q^2 -phrase within the P^2 can function as a remnant of Gapping, cf. (147), and can be questioned by WH-movement, cf. (148).

(147) De ene veiligheidsagent stond twee meter achter de
grootvorstin en de andere veiligheidsagent
~~stond~~ [_P² [_Q² drie meter] [_P, ~~achter de grootvorstin~~]].

(One body-guard was standing two meters behind the
duchess and the other body-guard ~~was/standing~~ three
meters ~~behind the queen~~.)

(148) Hoeveel meter stond de veiligheidsagent achter de grootvorstin?

(How many meters was the body-guard behind the duchess?)

The smaller P'-phrase within the P² in (144) cannot function as a remnant of Gapping, cf. (149), and cannot be questioned by WH-movement, cf. (150).

(149) *De ene veiligheidsagent stond enkele meters achter de grootvorstin en de andere veiligheidsagent

$\$ \text{t} \phi \text{v} \text{r} \text{st} \text{i} \text{n} / \text{1} / \text{2} / \text{1} / \text{2} \text{e} \text{n} \text{k} \text{e} \text{l} \text{e} / \text{m} \text{e} \text{t} \text{e} \text{r} \text{s} / \text{1} \text{p} \text{,} \text{a} \text{c} \text{h} \text{t} \text{e} \text{r} \text{d} \text{e} \text{k} \text{o} \text{n} \text{i} \text{n} \text{g} \text{i} \text{n} \parallel$.

(One body-guard was standing several meters behind the duchess and the other body-guard ~~was~~ / ~~standing~~ ~~several~~ / ~~meters~~ behind the queen.)

(150) *Achter wie stond de veiligheidsagent enkele meters?

(Behind who was the body-guard several meters?)

Zwarts proposes to explain this parallel between WH-movement and Gapping by a constraint on the variable in both rules: a variable may not contain one P²-bracket, unless it contains the other at the same time. The same holds for N²-brackets. In this way the variable in the rule is made to respect both NP and PP boundaries. Let us call this, for the sake of reference, the "Bracket Constraint".

In order to explain the grammaticality of (147) and (148), in which the variables contain a P²-bracket, Zwarts adds to this constraint two modifications. First, transformations apply to standard factorizations in the sense of Peters and Ritchie (1973, 57): a factor cannot contain as its leftmost symbol a right bracket, nor as its rightmost symbol a left bracket. According to this, the leftmost P²-bracket in (151) is not included in the variable W₁:

(151) W₁ [P² wh-Q² W₂

As a consequence, the extraction of $wh-Q^2$ in (148) is necessarily leftward, and cannot be rightward:

$$(152) \quad W_1 \mid \begin{array}{c} P^2 \\ \leftarrow \end{array} \mid wh-Q^2 \mid \begin{array}{c} W_2 \\ \rightarrow \end{array} \mid P^2 \mid W_3$$

The mirror-image of this phenomenon is Extraposition from NP. The relative clause is right-peripherally contained in the NP, and is moved rightward. It cannot move leftward, given the constraint on the variable, and the notion of standard factorization.

$$(153) \quad W_1 \mid \begin{array}{c} N^2 \\ \leftarrow \end{array} \mid W_2 \mid S \mid \begin{array}{c} N^2 \\ \rightarrow \end{array} \mid W_3$$

It is obvious that there will be variables to contain an offensive boundary, since WH-movement and Extraposition are defined as in (154) and (155).

(154) WH-movement (Zwarts 1978, 366)

$$\begin{array}{ccccc} W_1 & E & W_2 & X^2 & W_3 \\ & & & +W & \\ 1 & 2 & 3 & 4 & 5 \Rightarrow \\ 1 & 4 & 3 & \emptyset & 5 \end{array}$$

(155) Extraposition (Zwarts 1978, 373)

$$\begin{array}{ccccc} W_1 & S^2 & W_2 & S^2 & W_3 \\ 1 & 2 & 3 & 4 & 5 \Rightarrow \\ 1 & \emptyset & 3 & 2 & 5 \end{array}$$

Zwarts is forced to add therefore, that the constraint on the variable holds only for variables between specified positions, i.e. for W_2 , and not for W_1 and W_3 in (154) and (155). This is the second modification of the Bracket Constraint.³

We have four objections against Zwarts' analysis. First, it is not possible to extract a Q^2 -phrase from NP in Dutch. Just as English PP and NP, Dutch NP is closed.

- (156) *Ik weet niet [_{Q²} hoeveel kilo] hij [_{N²} andijvie]

koopt.

(I know not how many pounds he endive buys)

- (157) Ik kocht vijf kilo andijvie en hij ~~kocht~~

[_{N²} [_{Q²} zes kilo] ~~andijvie~~].

(I bought five pounds (of) endive and he

~~bought~~ six pounds ~~(of)/endive~~.)

The grammaticality of (157) is a surprise until one realizes that the deletion of andijvie does not result from Gapping, cf. (158).

- (158) Ik koop vijf kilo andijvie als ik weet dat jij

[_{N²} [_{Q²} zes kilo] ~~andijvie~~] koopt.

(I buy five pounds (of) endive if I know that you six pounds ~~(of)/endive~~ buy.)

The adherence of the "nouny" QP to its NP cannot follow from some version of the A-over-A Constraint, since a deeper embedded QP cannot be a remnant either:

- (159) *Jan fotografeert twintig meter hoge torens en Piet

~~fotografeert~~ [_{N²} [_{A²} [_{N²} dertig meter] ~~hoge~~]/~~torens~~]

(John photographs twenty meters high towers

and Peter ~~photographs~~ thirty meters ~~high~~/towers.)

One might object that this is a straw man to begin with since clearly the NP does not offend Zwarts' proposal, but appears to be subject to further constraints. But if these add up to Bach and Horn's NP Constraint, the NP constituent will be irrelevant to the discussion, and the constraint will hold for Dutch PP only.

Second, according to the Bracket Constraint, a string such as achter de grootvorstin gaan staan cannot be gapped between two remnants, but in (160) it is.

- (160) Hij is vijf meter achter de grootvorstin gaan staan
 bij de eerste wedstrijd en ~~hij is~~ |_{P²} |_{Q²} drie
 meter | ~~achter de grootvorstin~~ |_{P²} |_{Q²} gaan staan bij
 de tweede wedstrijd.

(He has five meters behind the duchess gone standing
 during the first game and ~~he has~~ three meters ~~behind~~
~~the duchess gone standing~~ during the second game)

This is a direct counterexample, and it is not easy to see how Zwarts' analysis can be modified in order to capture it.

Third, consider the following. The Bracket Constraint predicts that the left-peripheral part of a major constituent can function as a second remnant, and that the right-peripheral part of a major constituent can do so as a first remnant.⁴ The gappings presented by Zwarts ((147) and (157)) illustrate the former combination. Examples with the latter illustrate that this prediction is false. Right-peripheral parts of leftmost constituents never function as remnants:

- (161) a. *Auto's met ronde wielen rijden soepel en
 |_{N²} |_{P²} |_{Q²} met vierkante wielen |_{N²} |_{P²} |_{Q²} stug.
 (Cars with round wheels run smoothly and
 cars with square wheels ~~run~~ rigid.)
- b. *Kritiek op de dagbladen wordt gepubliceerd in de
 weekbladen en |_{N²} |_{P²} |_{Q²} op de weekbladen |_{N²} |_{P²} |_{Q²}
 wordt gepubliceerd in de dagbladen.
 (Criticism on the daily papers is published
 in the weekly papers and ~~criticism~~ on the weekly
~~is published~~ in the daily papers.)

- c. *Hij stond enkele meters achter de grootvorstin
 bij de eerste wedstrijd en $\lambda_1 \delta / \phi \epsilon \phi \eta \delta / \lambda_2 \delta / \phi \eta \kappa \delta \lambda \delta$
 $\eta \phi \epsilon \delta \epsilon \delta / \lambda_2 \delta / \phi \delta \eta \epsilon \delta \epsilon \delta \mid_{N^2}$ de koningin|||
 bij de tweede wedstrijd.
 (He was several meters behind the duchess
 during the first game and $\eta \phi / \eta \delta \delta / \phi \delta \nu \delta \epsilon \delta \lambda$
 $\eta \phi \epsilon \delta \epsilon \delta / \phi \delta \eta \delta \delta$ the queen during the second game)

In order to protect the first remnant against the variable, Zwarts has to add the coordinator as a factor of the Gapping rule, as in (162).

(162) Gapping (Zwarts 1978, 363)

C	W_1	X^2	W_2	X^2	W_3
1	2	3	4	5	6 \Rightarrow
1	\emptyset	3	\emptyset	5	\emptyset

The first variable is predicted to behave as if enclosed between specified positions. However, this is the only and very suspect reason to enter the coordinator in the rule. The coordinator can reasonably be claimed to be relevant to the recoverability condition, but not so to the issue of possible remnants.

The fourth and last counterargument runs as follows. Zwarts' observations on QP in PP strongly remind one of the COMP-escape hatch on sentential structures. Here as well as in the case of Dutch PP, there is a major constituent in what seems to be specifier position. In both cases the rules may refer to the constituent in the specifier to the effect that it may serve as a remnant of Gapping, cf. (145) and (163), and may be questioned by WH-movement, cf. (146) and (164).

- (163) Ik weet dat Jan zei achter welke grootvorstin je stond en Piet ~~zei~~ [_S, [_{COMP}achter welke koningin] ~~je~~/~~stond~~].
 (I know that John said behind which duchess you were standing and Peter ~~said~~ behind which queen ~~you were~~/~~standing~~)
- (164) Ik weet wel [_S, [_{COMP}achter welke koningin] Piet zei [_S, [_{COMP} ____ dat] je stond]]
 (I know behind which queen Peter said that you were standing)

The set of observations (145) - (163) and (146) - (165) strongly suggests that Zwarts' analysis has missed a revealing generalization. An escapehatch on Ss and PPs in Dutch is in fact proposed by Van Riemsdijk (1978), and it appears that he is on the right track.

Again, one might object that this fourth consideration applies only if one feels that Subjacency is a relevant notion vis-à-vis the scope of syntactic rules, while this is not necessarily Zwarts' position. In his clear and detailed study, he conspicuously does not discuss the extraction of WH-constituents out of sentential structures, and Subjacency is not among his topics.

Be this as it may, the following two examples indicate that the Bracket Constraint cannot possibly generalize over maximal projections of S next to NP and PP. The first set of (well-known) examples consists of clauses with tenseless embeddings:

- (165) John wants to try to begin to write a novel, and Peter ~~wants~~/_S/~~to~~/~~try~~/_S/~~to~~/~~begin~~/_S/~~to~~/~~write~~ a play ||| .
 Jan wil proberen te beginnen een novelle te schrijven en Peter ~~wil~~/~~proberen~~/_S/~~te~~/~~beginnen~~ [_S, een toneelstuk ~~te~~/~~schrijven~~]].

The second set consists of clauses with sentential subjects:

(166) Which dress to wear is a problem for Sue, and
 |_S, which tie ~~to wear~~ / |_S / |_S / a problem for John.

Welke jurk je moet dragen is een probleem voor Susan
 en |_S, welke das ~~je moet dragen~~ / |_S / |_S / een probleem
 voor John.

Whatever further analysis Zwarts will give for WH-movement and Subjacency, and for the parallelism of PP and S-structures observed above, at this moment we fail to see the strength of his analysis of Gapping phenomena.

2.2.5. SUBJACENCY REFORMULATED

Since the thesis of Ross (1967), generative grammarians have been well aware of the fact that the scope of rules is constrained by a relatively unrevealing variety of structural configurations, known as islands and semi-islands. The notion of Subjacency was introduced to derive the Island Constraints from formal abstract principles. One might say that Subjacency and the Binding Conditions were introduced to explain Ross' results. Under this view, Ross' thesis defines what the theory of syntax has been about for the last twelve years. This is not to say that Ross defined what the issues were to be, but his work has provided to a large extent the observation language, i.e. the terms by which factual statements ("this is a grammatical sentence") can be interpreted as theoretically meaningful factual statements ("this is a violation of the WH-island constraint").

In this light, the analysis presented in this section joins one of the major streams of syntactic research of the past decade. Its assumed appeal resides in its basic idea that the similarities between Gapping and WH-movement are best handled by a derivative of Subjacency, so-called Strict Subjacency. The latter gives a unified explanation of the NP

Constraint, the Tensed S Constraint and the WH-island Constraint as constraints on both Gapping and WH-movement. Gapping and coindexing rules are claimed to share no features.⁵

2.2.5.1. PARAMETERS OF SUBJACENCY

If we consider the relevant literature since Chomsky (1973), the notion of Subjacency has received different interpretations in a number of ways:


- (a) the choice of cyclic nodes: NP/S, NP/S', or NP/S/S';
- (b) the number of cyclic boundaries: a rule may cross one boundary, or no boundaries at all;
- (c) the position of the cyclic boundary: a boundary not properly contained in the variable does, or does not count.

These alternatives will be discussed in this order in the following subsections.

THE CHOICE OF CYCLIC NODES

As regards the choice of cyclic nodes, all possible combinations of S and NP have been proposed in various recent works by Chomsky. In Chomsky (1973), S' and NP were considered to be cyclic; in Chomsky (1976), S and NP; and in Chomsky (1978), S', S, and NP. NP is constant here, since any constraint meant to replace the (Complex) NP Constraint needs to include NPs.

Let us consider the last alternative. If S and S' are both cyclic, there is an obvious problem for successive cyclic WH-movement, cf.:

(167) [_SCOMP [_S ... [_SCOMP [_S ... wh-X ...]]]]


Each WH-step bar the first crosses two cyclic boundaries.

As for Gapping, the choice of S and S' predicts a difference between (168) and (169):

- (168) Charles told who said which boys are coming along
and $|_S, \text{who } |_S \text{ said } |_S, \text{which girls}$
 $|_S \text{ are/coming/along } |||$.

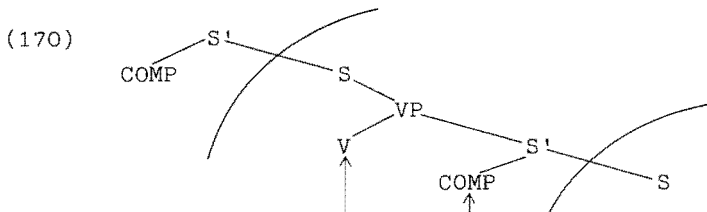
Karel vertelde wie gezegd heeft welke jongens er
mee gaan en $|_S, \text{wie } |_S \text{ gezegd heeft } |_S, \text{welke meisjes}$
 $|_S \text{ er/with/go } |||$.

- (169) Max told that Peter said which boys are coming
along and $|_S \text{ John said } |_S, \text{which girls } |_S \text{ are/coming}$
 $\text{along } |||$.

Karel vertelde dat Peter gezegd heeft welke jongens
er mee gaan en $|_S \text{ John gezegd heeft } |_S, \text{welke meisjes}$
 $|_S \text{ er/with/go } |||$.

Two cyclic boundaries (S and S') separate the remnants in (168), whereas only one (S') does so in (169). Both (168) and (169) are grammatical, however.

Given (168), let us assume that either S' or S is cyclic, but not both. The question now arises how to account for the semi-open character of sentences. There do not appear to be any strong a priori reasons to choose between S' and S. However, since the complementizer subcategorizes the matrix verb, let us tentatively assume that they are in the same cyclic domain.



This implies that for the time being we will assume that S is a cyclic node and S' is non-cyclic.

THE NUMBER OF CYCLIC NODES

As regards the number of cyclic nodes, two alternatives present themselves: (a) the variable between the two specified positions may not contain a cyclic boundary, and (b) it may contain one cyclic boundary at most. Chomsky argues that the latter option should be chosen in order to allow successive cyclic WH-movement (Chomsky 1974, 3d lecture, 27). Additionally, Chomsky (1976) offers rules which apply across the NP boundary: recall the examples of (109), here repeated as (171). The restriction of the scope of variables to one cyclic domain will be too strong for these examples.

(171) A review (t) was published of Bill's book.

Of the students in the class several (t) failed the exam.

For gapped sentences, however, the opposite holds: the output of Gapping is ungrammatical even if only one NP- or S-boundary is contained in the variable: cf. (112), repeated here as (172).

(172) a. Complex NP Condition

* John discussed the problem of which roses are to be planted and Peter ~~discussed~~/NP the problem (of) which appletrees ~~are~~/NP to be planted/NP.

* Jan besprak de vraag welke rozen geplant moesten worden en Peter ~~besprak~~/NP de vraag welke appelbomen ~~geplant~~/NP moesten worden/NP.

b. NP Constraint

* Charles destroyed an article about the moon and Peter ~~destroyed~~/NP an article about the sun|NP.

* Karel vernietigde een artikel over de maan en Piet ~~vernietigde~~/NP een artikel over de zon|NP.

c. WH-island Constraint

* John asked what to write to Mary, and Peter
~~asked/what/~~ \int ~~to/write~~ to Sue \int S.

* Jan vroeg wat aan Marie te moeten schrijven en
 Peter ~~vraag/wat~~ \int S aan Susan ~~te/moeten~~
~~schrijven~~ \int S.

Therefore, I will assume that variables may not cross a cyclic boundary. It follows that the structures in (171) are not derived by a movement rule in a way suggested by the traces. Moreover, within the present variants of Subjacency, it will not be possible to generalize over Gapping and WH-movement. This is a clearcut problem: the scope of both rules can be formulated in the same unadorned observation language of islands and semi-islands that we owe to the work of Ross. If, as we have suggested above, the introduction of abstract notions such as Subjacency and the Binding Conditions is meant to be superior to the Rossian observation language, then obviously no concept of Subjacency can be claimed to have overcome the observation language if it has not done so for both rules, WH-movement as well as Gapping.

THE POSITION OF THE CYCLIC BOUNDARIES

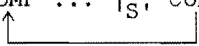
As a third parameter we mentioned in the preliminaries to these sections the position of the cyclic boundary. In Neijt (1978b) it was argued that variables may not cross cyclic boundaries (there taken to be S' and NP), unless these boundaries are peripheral. This condition is formulated in Amherst-Subjacency terms (Chomsky 1974, 3d lecture, 34) as follows:

(173) $W \neq W_1 \mid_{\alpha} W_2$ where: α is a cyclic node
 and neither W_1 nor W_2 is empty.

This explains the Tensed S Condition plus COMP-escape hatch as follows. In (174) S' is peripherally contained in the variable and (174) is grammatical. In (175), on the other hand, S' is internally contained in the variable, and (175) is ungrammatical:

- (174) John said how many girls should go and Bill
~~said~~ [_S, how many boys [_S ~~should~~/~~go~~]].
 Jan zei hoeveel meisjes er moesten gaan en Bill
~~zei~~ [_S, hoeveel jongens [_S ~~er~~/~~moesten~~/~~gaan~~]].
- (175) *John said that some girls should go and Bill
~~said~~ [_S, ~~that~~ [_S some boys ~~should~~/~~go~~]].
 *Jan zei dat er enkele meisjes moesten gaan en Bill
~~zei~~ [_S, ~~dat~~ [_S ~~er~~ enkele jongens ~~moesten~~/~~gaan~~]].

COMP-to-COMP movement follows, since in that case S' is peripheral (W₂ is empty):

- (176) ... COMP ... [_S, COMP ...


The Complex NP Constraint follows, since the NP-boundary is contained in the variable (neither W₁, nor W₂ is empty), cf.

- (177) *John answered the question which roses he would
 prefer and Bill ~~answered~~/~~the~~/~~question~~ [_S, which
 appletrees ~~he~~/~~would~~/~~prefer~~]].
 *Jan beantwoorde de vraag welke rozen hij het liefst
 had en Bill ~~beantwoorde~~/~~de~~/~~vraag~~ [_S, welke
 appelbomen ~~he~~/~~het~~/~~liefst~~/~~had~~]].

However, this proposal is falsified by the observation that a remnant may be chosen arbitrarily, and thus may accidentally be the constituent adjacent to a cyclic boundary, as shown in (178):

- (178) a. *
 John discussed with Peter the question of which
 car he would like to buy and *discussed* with
 Max $|_{NP}$ *the/question* (of) $|_S$, which bike
he/would/like/to/buy ||.
- *
 Jan besprak met Peter de vraag welke auto hij
 graag zou kopen en *besprak* met Max $|_{NP}$ *de/vraag*
 $|_S$, welke fiets *hij/graag/tou/kopen* ||.
- b. *
 I wonder which city Peter thinks you visited and
 $|_S$, which city $|_S$ Susan *thinks/you/visited* ||.
- *
 Ik vraag me af welke stad Peter denkt dat je
 bezocht en $|_S$, welke stad $|_S$ Susan *denkt/dat/je*
bezocht ||.

From these examples it seems obvious that the Gapping remnants can never belong to different cyclic domains. Therefore, the proposal of Neijt (1978b) must be rejected: Amherst Subjacency cannot be used to constrain the variable of Gapping. Cyclic boundaries, in no matter what position, constrain the applicational domain of rules.


2.2.5.2. STRICT SUBJACENCY

As the notion of Subjacency as it stands is unable to capture the Gapping facts, I propose the following version of "Strict Subjacency".

- (179) Strict Subjacency (first formulation)
 No rule may involve X, Y in
 ... X ... $[\alpha$... Y ... $]$... X ...
 where α is S or NP.

(179) covers the NP Constraint and the Tensed S Condition. The constraint is too general, however, in that it excludes WH-movement in a simple case such as (180).

(180) [_S, COMP [_S John eats what]]



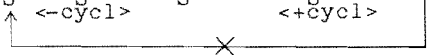
In order to remedy this defect, let us assume that the contents of the COMP nodes influence the applicability of rules. Thus, S is a semi-island, i.e. it becomes a closed domain such as NP iff its specifier is lexically filled. This can be expressed by the following convention:

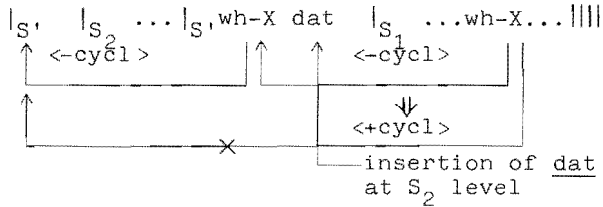
(181) Cyclicity Changing

S changes from non cyclic to cyclic in case
the immediately preceding COMP is filled; and
S changes from cyclic to non cyclic in case
the immediately preceding COMP is emptied.

Cyclicity Changing accounts for the semi-island character of sentences. By Cyclicity Changing, S is non-cyclic at the point WH-movement applies, while as a consequence of WH-movement S will become cyclic. Furthermore, if we assume that lexical insertion is cyclic (Bowers 1972, 681; Schachter 1973, 39; and Evers 1975, 83), it follows that an embedded clause is closed in case lexical insertion of the complementizer occurs. "Unbounded" WH-movement must apply successively cyclicly in tensed sentences with an overt complementizer that or dat: once the COMP is filled (which is obligatory in the case of tensed clauses in Dutch, otherwise the output is filtered out), S counts as a cyclic boundary, and the WH-constituent cannot be moved out:

(182) [_S, [_S ... [_S, dat [_S ... wh-X...]]]]





In tenseless sentences, and in certain English tensed clauses, lexical insertion of COMP is optional and nonfilling of COMP is ruled out by filters only under special circumstances. In these sentences, WH-movement may (though need not) apply successively cyclicly: both options are allowed.

The WH-island Condition follows quite naturally from this: once a WH-constituent occupies the COMP-position, the following S node is cyclic, and no other WH-constituent may be moved out.

Strict Subjacency can now be formulated as follows:

(183) Strict Subjacency (revised)

No rule may involve X, Y in

... X ... [α ... Y ...] ... X ...

where α is NP

or α is S iff its specifier is lexically filled.

Then consider Gapping. As predicted by Strict Subjacency Gapping may delete over any number of S-boundaries if the complementizers are empty, as in (184), but it may not delete over a S-boundary if the complementizer is filled, as in (185).

(184) John wants to try to begin to write a novel and

Peter ~~wants to try to begin to write~~
a play ||| .

Jan wil proberen te beginnen een novelle te
schrijven en Peter ~~wil proberen te beginnen~~
|_S een toneelstuk ~~te schrijven~~ |.

- (185) * John assumes that he will write a novel and Peter
~~assumes/that/he/will/write~~ a play|.

* Jan veronderstelt dat hij een novelle zal
 schrijven en Peter ~~veronderstelt/dat/hij~~ een
 toneelstuk ~~zal/schrijven~~.

As a further illustration, consider the Dutch complemen-
 tizer for tenseless clauses om. If om is obligatory (cf.
 (186)) Gapping may not apply across the S-boundary, cf.
 (187):

- (186) Karel ging weg *(om) brood te halen.
 (Charles went away *(for) bread to get)
- (187) * Karel ging weg om brood te halen en Peter
~~ging/weg/om~~ wijn ~~te/halen~~.
 (Charles went away for bread to get and Peter
~~went/away/for~~ wine ~~to/get~~)

Even if om is optional, as in

- (188) Hij probeerde (om) Bernard te imiteren.
 (He tried (for) Bernard to imitate;
 he tried to imitate Bernard.)

the presence of om in the first conjunct is incompatible with
 a gap in the second for most speakers:

- (189) Kees probeerde (*om) Bernard te imiteren en
 Harry ~~probeerde/om~~ Fred ~~te/imiteren~~.

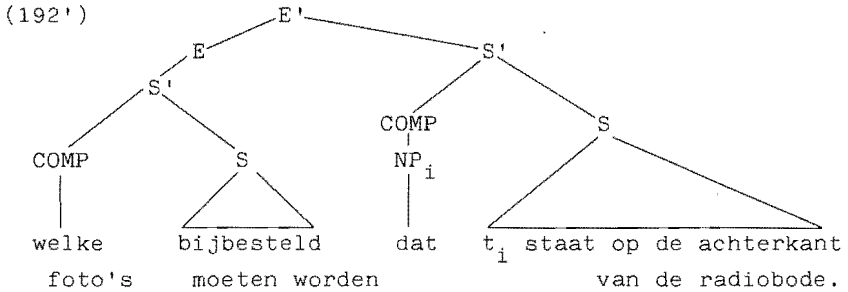
Presumably, this pattern is paralleled in English by optional
that:

- (190) John believes (that) the dog is ill.
- (191) John believes (*that) the dog is ill and
 Charly ~~believes/that~~ the cat ~~is/ill~~.

A similar effect can be observed in examples with a sentential subject (discussed in 2.1.4. above), after which the presence of a pronoun (dat) is optional in Dutch:

- (192) Welke foto's bijbesteld moeten worden (dat) staat op de achterkant van de radiobode.
 (Which photos require a repeat order (that) is specified on the back page of the TV-guide)

Assume that dat is in COMP position (cf. Koster 1978a, 61), i.e. that the structure underlying (192) is (192').



If dat is present, the following S is cyclic by virtue of Cyclicity Changing, and none of its elements can function as a remnant together with an element outside of S. This can be verified by (193a) and (193b):

- (193) a. * Welke foto's bijbesteld moeten worden dat staat op de achterkant van de radiobode en welke dia's ~~bijbesteld moeten worden dat staat op~~ het bloknoot in de keuken.
 (Which photos require a repeat order that is specified on the back page of the TV-guide and which slides ~~require a repeat order that is~~ specified on the tear-off pad in the kitchen)

- b. Welke foto's bijbesteld moeten worden staat op de achterkant van de radiobode en welke dia's ~~bijbesteld worden/zijn~~ op het bloknoot in de keuken.

(Which photos require a repeat order is specified on the back page of the TV-guide and which slides ~~require a repeat order is specified~~ on the tear-off pad in the kitchen)

2.2.5.3. THE INTERACTION OF GAPPING AND WH-MOVEMENT

The revised version of Strict Subjacency in (183), however, is not (yet) fully accurate. Constructions exist where WH-movement and Gapping interact in a perfectly grammatical way, e.g.:

- (194) Who eats an apple and

$[_S \text{ who}_i \quad [_S t_i \text{ ~~eats~~ a pear}]]?$

This sentence is incorrectly excluded by Strict Subjacency. Here, Gapping leaves as remnants two constituents which are in different cyclic domains, by virtue of previous filling of the COMP by WH-movement. For such cases, a more sophisticated version of Strict Subjacency is required. It seems that Strict Subjacency can be disobeyed if the constituent outside of the cyclic domain binds a trace within the cyclic domain. Unattractive though this may be, we are forced to add an unless-condition to Strict Subjacency:

- (195) Strict Subjacency (final version)

No rule may involve X, Y in

$\dots X \dots [\alpha \dots Y \dots] \dots X \dots$

where α is NP,

or α is S iff its specifier is lexically filled, unless X binds a trace t_x in α , and there is no cyclic boundary between t_x and Y.

Strict Subjacency resembles the Specified Subject Condition, which contends that X and Y in different cyclic domains cannot be related over a subject, unless X controls it. In the same vein, Strict Subjacency forbids a rule to relate X and Y in different cyclic domains, unless X controls a trace within the cyclic domain of Y.

This trace-escape hatch predicts that combinations of Gapping and WH-movement obey the pattern of (196), a prediction which is borne out, as can be verified by (197):

- (196) a. $|_{S,wh-X_i} |_S \dots |_{S,} |_S \dots Y \dots t_i \dots |||$
 b. $*|_{S,wh-X_i} |_S \dots Y \dots |_{S,} |_S \dots t_i \dots |||$
 c. $*|_{S,wh-X_i} |_S \dots t_i \dots |_{S,} |_S \dots Y \dots |||$
 d. $|_{S,wh-X_i} |_S \dots Y \dots t_i \dots |_{S,} |_S \dots |||$

- (197) a. What presents did you say that you bought for your mother and what presents *did/you/say/that you/bought* for your father?

Welke cadeautjes zei je dat je voor je moeder gekocht hebt en welke cadeautjes *zei/je/dat/je voor je vader gekocht/hebt*?

For whom did you say that Peter believed that you should bring wine, and for whom *did/you/say/that/Peter/believed/that/you/should/bring* beer?

Voor wie zei je dat Peter dacht dat je wijn in moest schenken en voor wie *zei/je/dat/Peter dacht/dat/je bier in/moest/schenken*?

- b. * What did you say today that Peter bought for his mother and what *did/you/say* yesterday *that/Peter/bought/for/his/mother*?

* Wat zei je vandaag dat Peter voor zijn vader gekocht had en wat *zei/je gisteren dat/Peter voor/zijn/vader/gekocht/had*?

- * Who did you tell Peter that you believed
that he should visit and who *dɪd/ʃə*
ʔɛɪl John *ʔhæt/ʃə/vɛɪzɪt/ʔhæt/hɛ/ʔhəvɪd*
ʃɪʔɪt?
- * Wie heb je tegen Peter gezegd dat je dacht
dat hij moest bezoeken en wie
hɛb/ʃɛ tegen John *ɡɛzɛɡd/dæt/ʃɛ/dɑχt/dæt/hɪj*
moest/bezoekən?
- c. * Who thought that he should bring wine and
who *ʔhəvɛɪt/ʔhæt/hɛ/ʔhəvɪd/brɪŋ* beer?
- * Wie dacht dat hij wijn mee moest nemen en wie
dɑχt/dæt/hɪj bier *moest/nemen*?
- d. Who thought that he should bring wine, and who
ʔhəvɛɪt that he should bring beer?
- Wie dacht dat hij wijn mee moest nemen en wie
dɑχt dat hij bier mee moest nemen?

This analysis crucially assumes that traces are left behind in argument position, but not in COMP-position (see Huybregts 1976, 348). If a trace were left behind in COMP, the (b)- and (d)-cases of (197) could not be distinguished.

The relation between X and Y in (196a) and (196b) above, is structurally identical to (196c) and (196d), respectively, the only difference being the position of the trace. The generalization is that deep structure clausemates may be the remnants of Gapping, no matter how far their distance in surface structure. It may seem in this respect, that the unless-clause introduces the notion of deep structure clausemate, but this is not true. The notion deep structure clausemateness by itself is inadequate in view of the grammaticality of sentences such as (198) and (199).

(198) John told me which books were ordered and Peter
ʔɔɪd/hɛ which journals *wɛrɔ/ɔrdərd*.

Jan vertelde me welke boeken besteld werden en Piet
ʔɛɪtɛld/hɛ welke tijdschriften *bɛstɛld/wɛrdɛn*.

(199) Who told you which books were ordered and who
told you which journals were ordered?

Wie vertelde je welke boeken besteld werden en wie
vertelde je welke tijdschriften besteld werden?

The second remnant in these examples is not a deep structure clausemate of the first remnant. It is only after WH-movement that the two remnants fall under the scope of the Gapping rule. In brief, Strict Subjacency (195) formally represents the notion of deep and surface structure clausemateness, excluding intermediate structure clausemateness.

3. CONCLUSIONS

This thesis elaborates on the assumption that Gapping is a relatively "unmarked" phenomenon, its properties being almost completely predictable from independently motivated mechanisms. The unmarked character of the rule is reflected in the rule format proposed: the only information incorporated in this is "Delete". The basis for this simple formulation is given in chapter 2, where all information beyond "Delete" was shown to result in undergeneration. It was observed that the choice between over- and undergeneration squeezes the direction of further research. Adoption of an undergenerating rule requires the support of independently motivated rules in order to generate the remaining cases. Adoption of an overgenerating rule requires the support of independently motivated principles in order to exclude the surplus. The success of either strategy depends on the appeal of the proposed additional rules or principles.

As regards Gapping, earlier studies assumed an undergenerating rule, but presented little independent evidence for the rules added. Here, the opposite strategy was pursued. The implications of the overgenerating rule "Delete" were investigated. Part of chapter 2 and chapter 3 in toto bear on the problem of how to filter out the ungrammatical products

of the rule. The problem was approached modularly: two aspects of the rule were distinguished and relegated to different components of the grammar. In chapter 2, we considered the part relating the gapped string and its antecedent. It was suggested, after Sag (1976), that this relation be primarily governed by recoverability of deletion, defined at the level of Logical Form.

The last chapter defended the claim that Gapping contributes to the theory of sentence grammar. Given a solution to the recoverability problem along the lines suggested, two closely connected questions emerged: which principles determined the shape of the remnants, and which constrain the distance between the remnants. For both, familiar constraints were put to use. As regards the shape of the remnants, versions of the A-over-A Principle, and the Head Condition were reviewed. Hankamers's Major Constituent Condition, however, was shown to best serve the facts. Constraints on the distance between the remnants of Gapping were shown to equal the familiar constraints on movement rules. Taking this as a point of departure, we developed the following conclusions:

(1) Gapping is an island-sensitive rule. The (Complex) NP Condition (cf. (64) - (68)), the WH-island Constraint (cf. (73)), and the Tensed S Condition (cf. (85) and (86)) constrain the distance between the remnants. Any attempt to explain Island Constraints from more abstract principles such as Subjacency and the Binding Conditions should include Gapping.

(2) The attempt by Koster (1978b) in terms of the Bounding Condition (132), by Zwarts (1978) in terms of the Bracket Constraint (section 2.2.4. and footnote 3), and by Neijt (1978b) in terms of a variant of Amherst Subjacency, to explain Island Constraints from abstract principles which include Gapping were found to be unsuccessful.

(3) There is no reason to expect that Gapping obeys constraints on bound anaphors, and in fact, the relation between the remnants is not governed by the notion of C-command (cf.

125). It is therefore a priori impossible to explain the island-sensitivity of Gapping by the Binding Conditions. More specifically, we saw that Gapping is not constrained by the Specified Subject Condition (129) and (130), although it is sensitive to the Tensed S Condition.

(4) Finding the Binding Conditions incapable of explaining the island-sensitivity of Gapping, one is tempted to confer the island-sensitivity of the rule upon Subjacency. However, none of the variations of Subjacency proposed in the literature (cf. Chomsky 1973, Chomsky 1974 and Chomsky 1976) is able to generalize over Gapping and WH-movement (cf. (113) and (114)).

(5) A new variant of Subjacency was proposed and christened "Strict Subjacency" ((195), repeated here as (200)).

(200) Strict Subjacency

No rule may involve X, Y in
 ... X ... [α ... Y ...] ... X ...
 where α is NP,
 or α is S iff its specifier is lexically filled.
 unless X binds a trace t_X in α , and there is no
 cyclic boundary between t_X and Y.

The new type of Subjacency led us to consider a new set of facts (197) based on the interaction between Gapping and WH-movement that turned out to support the proposal.

(6) The parallelism between English and Dutch throughout this study strongly suggests the applicability of universal principles in both systems.

FOOTNOTES TO CHAPTER 3

1. A true counterexample to the Major Constituent Condition in Dutch was brought up by Zwarts (1978):

- (i) Jan stond 10 meter achter de grootvorstin en Max
~~stond~~ 5 meter ~~achter/de/grootvorstin~~.
 (John was standing 30 feet behind the duchess and
 Max ~~was/standing~~ 15 feet ~~behind/the/duchess~~.)

The phrase 10 meter achter de grootvorstin forms one constituent, cf. (ii). 5 meter in (i) thus cannot be argued to form a major constituent, and (iii) reveals that the analysis sketched for (10) is not available for (i).

- (ii) 10 meter achter de grootvorstin stond Karel.
 (10 meters behind the duchess stood Charles)
- (iii) *Peter stond 5 meter ~~achter/de/grootvorstin~~.
 (Peter was standing 30 feet ~~behind/the/duchess~~)

2. Not all speakers agree with Stillings' judgements for the gapped examples, but this does not affect the present discussion: those speakers who accept the (i)-variants as grammatical, consider the (ii)-variants grammatical as well.

3. Zwarts' condition runs as follows (1978, 376):

"Conditie op variabele factoren:

Voor elke passende factorisering ($p_1, \dots, p_i, p_{i+1}, p_{i+2}, \dots, p_n$) met betrekking tot een transformatie T geldt: als p_{i+1} een variabele factor is en p_i en p_{i+2} constante factoren zijn, dan $R(p_{i+1}) = |_{A_1} |_{A_2} \dots |_{A_m}$, of $R(p_{i+1}) = |_{A_1} |_{A_2} \dots |_{A_m}$, waar voor generiek A_i ($i^m = 1, \dots, m$) geldt: $A_i = P^2_m$ of $A_i = N^2_m$."

Translated, the condition says:

For each proper factorization ($p_1, \dots, p_i, p_{i+1}, p_{i+2}, \dots, p_n$) with respect to a transformation T it holds that: if p_{i+1} is a variable factor, and p_i and p_{i+2} are constant factors, then either $R(p_{i+1}) = |_{A_1} |_{A_2} \dots |_{A_m}$, or $R(p_{i+1}) = |_{A_1} |_{A_2} \dots |_{A_i}$, where for no A_i ($i = 1, \dots, m$) it holds that: $A_i = P^{2^m}$ or $A_i = N^2$.

4. But cf. De Haan (1979) for another view of the impact of peripheral containment on Gapping phenomena.
5. This statement holds only for the small-scale formulation of Gapping ((40) of chapter 2). The extensive formulation of Gapping and coindexing rules are constrained similarly with respect to Antecedency Binding (cf. Huybregts 1976, 345). This condition disallows, roughly, incomplete antecedents, i.e. those containing a trace. For Gapping this implies that neither the gapped nor the full antecedent string may contain a trace that is not bound within that string. This excludes (i):

- (i) Jan speelt hiermee en Piet ~~speelt~~ daar ~~mee~~.
 (John plays here with and Peter ~~plays~~ there ~~with~~;
 John plays with this and Peter ~~plays~~/with ~~that~~)

Hier and daar in (i) bind a trace in PP as follows (cf. Van Riemsdijk 1978):

- (ii) Jan speelt [$hier$]_i [$_{PP}$ mee t_i] en
 Piet ~~speelt~~ [$daar$]_j [$_{PP}$ ~~mee~~ t_j].

The gapped string (as well as the antecedent string) is incomplete: it contains t_j . This trace cannot be considered one of the remnants, since remnants must be major constituents, and t_j is not a major constituent. This ex-

plains that the only possible gapped variant of (i) is (iii):

(iii) Jan speelt [hier]_i [pp^{mee} t_i] en
 Piet ~~speelt~~ [daar]_i [pp^{mee} t_j].

In (iii) the trace is part of one of the remnants, and therefore does not block the antecedent-anaphor relation of the gapped and the antecedent string.

In this thesis, the relation between the gapped part and its antecedent is not a main issue. We will leave this matter at a sketchy stage, referring the reader to Huybregts (forthcoming).

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